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AFML-TR-77-185

VOLUME II

## VERIFICATION OF PRODUCTION HOLE QUALITY

METCUT RESEARCH ASSOCIATES INC. CINCINNATI, OH 45209



NOVEMBER 1977

TECHNICAL REPORT AFML-TR-77-185 FINAL REPORT AUGUST 1975-SEPTEMBER 1977

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This final report was submitted by Metcut Research Associates Inc., Cincinnati, Ohio, under Contract No. F33615-75-C-5173, Manufacturing Methods Project 760-5, "Verification of Production Hole Quality". Mr. William A. Harris, AFML/LTM, was the laboratory monitor.

This technical report has been reviewed and is approved for publication.

William A. HARRIS
Project Engineer

FOR THE COMMANDER

H. A. SOMNSON
Chief, Metals Branch

Manufacturing Technology Division

AIR FORCE/56780/21 August 1978 - 275

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UNCLASSITICU SECURITY ASSIFICATION OF THIS PAGE (Moon Dote Printered) READ INSTRUCTIONS REPORT DOCUMENTATION PAGE HEFORE COMPLETING FORM Z GOVE ACCESSION NO. & RECIPIENT'S CATALOG NUMBER AFMLHTR-77-185 WARM SOL VERIFICATION OF PRODUCTION HOLE QUALITY. Final 1 Aug 1975 -31 Jul 🕍 🗺 77. olume II. William P./Koster, John B./Kohls, and John T./Cammett [Metcut Research]; F33615-75-C-5173 B.L. Cornell (Mockheed-Georgia Company) PERFORMING ORGANIZATION NAME AND ADDRESS PHOGRAM ELEMENT PROJECT, TASK AREA & WORK UNIT NUMBERS Metcut Research Associates Inc. 3980 Rosslyn Drive 760-5 Cincinnati, OH 45209 1 CONTROLLING OFFICE NAME AND ADDRESS IZ HEPORT DATE Air Force Materials Laboratory November 1977 Air Force Systems Command THEFT OF PAGES Wright-Patterson Air Force Base, OH 45433 14 MONITORING AGENCY MAME & ADDRESS(If different from Controlling Office) 15 STCHHITY CLASS (of this report) Unclassified 15# DECLASSIFICATION DOWNGRADING SCHEDULE 16 DISTRIBUTION STATEMENT (of this Report) Distribution limited to U.S. Government agencies only; Test and Evaluation Data; 5 February 1978. Other request for this document must be referred to the Manufacturing Technology Division Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio 45433. 17 DISTRIBUTION STATEMENT (of the obstract entered in Block 20, if different from Report) 18 SUPPLEMENTARY NOTES 19 KEY WONDS (Continue on reverse aide if necessary and identity by block number) surface integrity, hole quality, tapered fastener, interference, perpendicularity, bellmouthing, barrelling, ovality, surface finish, rifling, axial scratch, chatter, plastic deformation, tears, laps ABSTRACT (Continue on reverse side if necessary and identity by block number) Definitive surface integrity information identifying and ranking the importance of hole quality variables on the performance of tapered interference fit fasteners has been developed. This report summarizes the fatigue behavior of open hole specimens and low load transfer specimens containing a variety of metallurgical and geometric hole quality variables. Limited crack growth behavior is also reported.

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#### **FOREWORD**

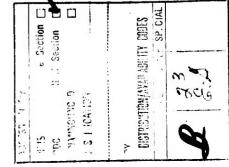
This final technical report covers all work performed under Contract F33615-75-C-5173 entitled "Verification of Production Hole Quality". This project was accomplished under the technical direction of W.A. Harris of the Metals Branch (LTM), Manufacturing Technology Division, Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio. The effort was performed during the period 1 August 1975 through 31 July 1977 and was released by the authors in September 1977. The effort dealt with the quality requirements for an interference fit tapered fastener system, and was oriented toward a specific application within the C-5A aircraft program. The material and fastener design selected were chosen because that combination was one considered for extensive use in future wing structure developments of the C-5A aircraft.

The subject contract was placed with Metcut Research Associates Inc. of Cincinnati, Ohio. Metcut chose as its principal subcontractor the Lockheed-Georgia Company of Marietta, Georgia. Metcut provided the overall technical direction of the program as well as the facilities for manufacturing all test specimens and performing all of the fatigue tests reported herein. The Lockheed-Georgia Company provided engineering direction and support for the analysis of the data which resulted from the effort.

At Metcut, the program was under the supervision of Dr. William P. Koster. John B. Kohls, Dr. John T. Cammett and L.R. Gatto also contributed to the effort. Activities at the Lockheed-Georgia Company were managed by C.G. Trevillion and supported by H.S. Gibson, B.L. Cornell and P.G. Dodd who performed much of the detailed numerical analysis.

This program was a continuation of the effort in the surface integrity/surface quality area which has been supported by the Air Force Materials Laboratory for the past eight years to provide information which will lead to the cost effective manufacturing of aerospace hardware by the American industrial sector.

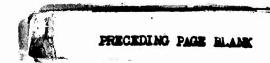
The final technical report on this contract is being prepared in two volumes. Volume I is the final summary report on all work performed including the necessary tables to document the procedures and the results obtained. Volume II contains the complete inspection reports on all specimens manufactured under this contract.



PRECEDING PARE MAN

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#### INTRODUCTION

Under the performance of Contract No. F33615-75-C-5173 entitled "Verification of Production Hole Quality", something in excess of 360 aluminum panel fatigue specimens were prepared. These included specimens for evaluating the parent metal fatigue strength of the material, open hole specimens and low load transfer specimens of both dogbone/strap and reverse dogbone design.

All of these specimens, with the exception of the parent metal group, contained two tapered holes. For each specimen, a detailed inspection sheet or manufacturing report was prepared. This document identified the specific parameters used to finish the test holes. In addition, these sheets contain an inspection report summarizing the measured characteristics of both holes in the same specimen. Data includes surface finish, fastener protrusion (a measure of interference), perpendicularity, flushness, capacitance gage reading and a compilation of the air gage measurements taken on each hole. The results of a standard bluing pin test and the percentage of bearing indicated by this test are also included in these sheets.

This volume, an appendix to the main technical report, contains copies of the manufacturing reports for all of the specimens produced in this program which contained tapered holes. They are placed in order of test series as indicated in the Table of Contents. This information is being provided to permit further detailed study and analysis and interpretation of the data presented in the accompanying technical report.

INSPECTION SHEETS FOR BASELINE

Test Series	_ Qual	ity Vari	able _	BASE	LINE -	S/N C	URVE		-
Produce Good Hole Us Tools: #2 Centerdri Spindle, rpm Cutting Fluid: ST	11; 19. 325	/64 in. ;	pilot dr	TTI; Grou Feed	p 1, Omar :	-0.5T	PM		-5)
Results: Specimen Surface Finish, A Protrusion, in. Perpendicularity,	A 3	<u>s - ç :</u> 33	11.15	Hole #1	 	Bluing	Pin Rol	lout	
Longitudinal Flush Gage Readin Capacitance Gage Exit Burr Height,	g, in. Reading in.	Transve 	2 APTER	BLUNG	 	7.	07.	,	
	<u>A</u>		Reading: lar Posi	s (.0001	in.)				1
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
Bottom #1 #2 #3 #4 #5	†   1 0 2.5 1 3	1 1 1 1.5 1 3 - 4	+ 1.5 + 2.5 + 2 + 3	. / . / . / . / . / . / . / . /	1 /5 1 2 + 2.5 1 3 1 2	1 2 1 3 1 2.5 1 4 1 2.5	+ 2.5 + 3 + 1.5 + 2 + 1	2 2 2	
Surface Finish, AAP Protrusion, in. Perpendicularity, Longitudinal AF Flush Gage Reading Capacitance Gage Rexit Burr Height,	.001 in .001 in .002/14 1, in. Reading:	r Gage	length rse	(.0001 i	- - - - n.)		Pin Roll	out 	
Axial Position	0°	Angul 45°	ar Posi 90°	ion 135°	180°	225°	270°	315°	1
#2 #3 #4	+   +   0 1   +	0 : 1,5	+ 0.5 + 1 + 1 + 2. + 1	2 ± L 1.5 1.2 1.3	; 1 ; 1 ; 1 ; 1.5 ; 1.5 ; 1.5	0.5	+ 1.5 + 1 + 1.5 + 2	+ 1 - 0 - 2.5	

Test S	eries	Quali	ity Varia	ble	BASE	LINE	- 5/N	CURY	4
Tools: Spindle	e Good Hole Use #2 Centerdre, rpm 32 g Fluid: 5/2	111; 19/ <b>5</b>	64 in. j	oilot dr	ill; Group	o 1, Omari : <u>///</u> h: (Ind.			
Sur	s: Specimer face Finish, A trusion, in.	M 50-	60 44		tole #1 (	1747 N.S.	Bluing	Pin Roll	out
Peri Flus	pendicularity Longitudinar sh Gage Readir acitance Gage t Burr Height,	, .001 i 322 // 19, in. Reading in.	n./gage Transve 	3 3	(.0001 i	- -		65%	
	,			ar Posi					
	Axial Position	0°	45°	90°	135°	180"	225°	270°	315°
	Bottom #1 #2 #3 #4	+2 +1 0 +1 +7	+2 +2 -2.5 +1.5 -3.5	#3 =1 #1 +8	† 2 † 3 † 0.5 † 2.5 † 5	+3.5 +1.5 +1. +1. +1.	+3 +1.5 -a +1.5 +8.5	+ 2-	+0.5 -0.5 +1 +5
Prot Perp Flus	face Finish, A crusion, in. pendicularity, Longitudinal th Gage Readin ccitance Gage Burr Height,	.001 i	n./gage Transve	length rse			Bluing	Pin Roll	out
Exit	: Burr Height,		ir Gage	Readings	(.0001 i	<u>n.)</u>		70%	
	Axial	T	Aligu	ar Posi	100	Ì	·		
	Position	0°	45°	90°	135°	180°	225°	270"	315"
	Bottom #1	21.2	+1	+1.5	+1.5	+2.5	+3	+2.5	+2.5
	#2	+1.5	+1	11	+1	+2	4- 3	43.0	
	#3	0	10.5	+0.5	+2	+4	+1	=1	+3
	#4	-0.5	+1	+2	+3	+3	4 2	++-	+!
	#5	+4.5	+6		+9	+ 7	+3.5	7.	+6

Test Series	Quali	ty Vari	able	BALL	LINE	- 4N	CURVE	-8		
Produce Good Hole tools: #2 Centerdr Spindle, rpm Cutting Fluid: 57		64 in. i	pllot dr				Jeamer (11	D2040AR1=5)		
Results: Specime Surface Finish, Protrusion, in. Perpendicularity Longitudinal Flush Gage Readi	AA <u>50.</u> 	n./gage Transve	length erse	dole #1 (	-		Pin Roll	out .		
Capacitance Gage Exit Burr Height	, in	.0/5			-	10175				
	A		Readings lar Posi	(.0001 i	n.)					
Axial Position	0°	45°	90°	135°	180"	225	1. (0-	, ; 1 f		
Bottom #1 #2 #3 #4 #5	+112	+ 1 + 1 + 3\frac{1}{2} + 3\frac{1}{2}	; 1 ; 1 ; 1 ; 1	† 2 † 1 † 1 † 1.5 † 10	+ /· 5 + 2 + 2 + 10	· 4 · 2 · 10	0.5	1 3 1 1/1		
Surface Finish, AA 45-65 (company)  Protrusion, in										
Longitudinal Flush Gage Readir Capacitance Gage Exit Burr Height	ng, iñ. Reading , in.	00 -305 -016	!			7	,			
	^		lar Posi	(.0001 i tion	(1,)					
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°		
Bottom #1 #2 #3 #4	12.5 12.5 12.5 15.1	† 3.5 † 4. † 4.5 † 12	· 4 · 5 · 2.5 • 4 • 12	4 4	+ 3 + 3 + 1.5 + 1.5	+ 3 + 2.5 + 1.5 + 1.2	1 2 1 2 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	+ 3 1 2.5 1 2 1 1 1 11.5		

Produce Good Hole Using Following Conditions:   Tools:	Test Serie	s	Quali	ty Varia	ble	BASE	LINE -	5/N	CURVE			
Surface Finish, AA 55-63 11.  Protrusion, in. 1/82  Perpendicularity, .001 in./gage length  Longitudinal	Tools: #2 Spindle, r	Centerdri pm	111; 19/ 32.5	64 in. p	oilot dri	11; Group Feed:	HAND-	-0.5 I	OM			
Capacitance Gage Reading: 370  Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°  Bettom #1 + 3 + 2 + 1.5 + 1 + 1.5 + 2.5 + 3.5 + 3.5 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1.5 + 1 + 1 + 1 + 1.5 + 1 + 1 + 1 + 1.5 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +	Surface Protrus Perpend Lon	Finish, A lion, in. licularity, gitudinal	A <u>55-</u> 1800. i	6341 2 n./gage Transve	length erse <u>00</u> 2				Pin Roll			
Axial Position 0° 45° 90° 135° 180° 225° 270° 315° Bettom #1 + 3 + 2 + 1.5 + 1 + 1.5 + 2.5 + 3.5 + 3.5 + 1.5	Capacit	ance Gage	Reading	:3	30		-					
Axial Position 0° 45° 90° 135° 180° 225° 270° 315°  Bettom #1 + 3 + 2 + 1.5 + 1 + 1.5 + 2.5 + 3.	Exit Bu	rr Height,			Pandings	( 0001 ;			709	•		
Position   0°   45°   90°   135°   180°   225°   270°   315°     Bettom #1   + 3   + 2   + 1.5   + 1   + 1.5   + 2.5   + 3.5     #2   + 1.5   + 1.5   + 1   + 1   + 5   + 2.5   + 3.5     #3   + 2.5   + 1.5   + 1   + 1   + 5   + 1   0   + 2.5     #4   + 4.5   + 3.5   + 2   + 1.5   + 1   + 1   + 1.5     #5   + 11   + 11   + 11   + 11   + 12     Protrusion, in.   1/79	.=						11.7			- 10		
#2 +1.5 +1.5 +1.5 +1.5 +1.5 +1.5 +1.5 +1.5			0°	45°	90°	135°	180°	225°	270°	315°		
3	В		<del></del>				¥1.5	+2.5				
Hole #2   Hole #2   Surface Finish, AA   40-50   Mc   .					+1.5			T				
Hole #2   Surface Finish, AA   40-50   Ac   .	ļ				1 2	<b>√</b> — — — — — — — — — — — — — — — — — — —	+	+	1			
Surface Finish, AA 40-50 Ac  Protrusion, in. 179  Perpendicularity, .001 in./gage length  Longitudinal .cc		#5				<del></del>	+10	+11	+//	71		
Angular Position  Axial Position $0^{\circ}$ $45^{\circ}$ $90^{\circ}$ $135^{\circ}$ $180^{\circ}$ $225^{\circ}$ $270^{\circ}$ $315^{\circ}$ Bottom #1 +2 +2 +2 +2 +1.5 +1 +1 +2 +2 +3 +3.5 +1.5 +1 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1.5	Surface Finish, AA 40-50 AC.  Protrusion, in.  Perpendicularity, .001 in./gage length  Longitudinal											
Axial Position $0^{\circ}$ $45^{\circ}$ $90^{\circ}$ $135^{\circ}$ $180^{\circ}$ $225^{\circ}$ $270^{\circ}$ $315^{\circ}$ Bottom #1 $+2$ $+2$ $+2$ $+2$ $+3$ $+3.5$ $+1.5$ $+1$ $+1$ $+1.5$ $+1$ $+1.5$ $+1$ $+1.5$ $+1.5$ $+1$ $+1.5$ $+1.$			21						157.	•		
Bottom #1 +2 +2 +2 +2 +3 +3.5 +1.5 +1 +1 +2 +3 +3.5 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1 +1 +1.5 +1.5			00	_			1000	2250	2700	23.50		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Po	Position 0° 45° 90° 135° 180° 225° 270° 315°										
#3 +1 0 -1 +0.5 0 0 -0.5 +1 #4 +3 +3 +2 +2 0 +0.5 +1.5 +3	Вс			+2	+2	+2.5		+1	+/			
#4 +3 +3 +2 +2 0 +0.5 +1.5 +3												
	-	#3 +1 D -/ +0.5 D -0 -0.3 +/										
		#5	+8	+8	+7	4-5	+4	+6		+8		

Test Se	eries	_ Qual	ity Vari	able _	ASE L	INE -	SN	CURVE	<del>-</del>
Tools: Spindle			/64 in.			HAN	0-0.5		
Surf Prot	s: Specimer face Finish, A crusion, in. pendicularity,	A <u>58</u> -	-65 M	-m	dole #1	<del>-</del>	Bluing	Pin Rol	lout
Flus Capa	Longitudinal th Gage Readir scitance Gage Burr Height,	. <b>co4/k</b> ung, in. Reading in.	- - - in.)	90	د/٥				
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	#2 #3 #4 #5	0 0 1 +1.5 +5	+ 1.5 + 1.5 + 1.5 + 5	+ 0.5	+ 1.5 + 1.5 - 0 - 1.5 + 4.5	0 0 0 + 3	†   †   †   †   †   1   2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	+ 1 + 1 + 0.5 + 1.5 + 3.5
Prot Perpo     Flust	ace Finish, A rusion, in. endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 i	n./gage yTransve	length rse	1c #2	- - -	Bluing 65	Pin Roll	<u>out</u> "
ī	Axial	<u>A</u>		Readings lar Posit	(.0001 i	<u>n.)</u>	, <u>.</u>	<del> </del>	11
	Position 0° 45° 90° 135° 180° 225° 270°								
	#2 #3 #4 #5	+ 0.5 + 1 0 + 3.5 + 8.5	+ 1 - 0.5 + 2 + 3	+ 1.5 + 2.5 + 8	+1 +1.5 -0.5 +0.5	0 1 - 0 + 1 + 7	- 1.5 - 1.5 - a.5 + 1 + 7.5	+ 2 0 3 + 8	+ 2.5 + 2.5 - 0 + 2.5 + 7.5

Test Series	Quali	ty Varia	able	PASE	LINE -	- ///	- JK/		
Produce Good Hole	Using Fol	lowing (	Condition	ns:					
Tools: #2 Center		64 In. 1	ollot dr				camer (TL	D2040AR1-	5)
Spindle, rpm	325			Feed	: HAU	-2,5	Im		
Cutting Fluid:	MARCARI	700	VIN-	Depti	h: (Ind.	Reading)	1. 41	3	
Results: Specia	nen No. 5	C 5/3	1	lole #1 (	WARK A	1011			
Surface Finish		-46 N					Pin Roll	out	
Protrusion, in		27			-				
Perpendicularit									
tongitudin,		_		4 / INCH	-				
Flush Gage Reac			<u>04</u>		_				- 1
Capacitance Gag Exit Burr Heigf		012	<u> </u>		_		·	t,	,
			Readings	(.0001 i	in.)			Br.	
			lar Posi						
Axial									1
Position	0°	45°	90°	135"	180"	225"	270°	315"	
Bottom #1	+ 2.	- 2	0	11	1 1.5	4 ?	+ 4	1 \$	١
# 2		41	0	4 1	9 / 5	4 - 1	+ 4.5	145	İ
#3		12	11	- 1.5	1.7	12	40	4 1.5	1
#1		14	- 2.5	1.5	1 2.	+0.5	+ 2	4 4.5	Į.
With the Park Control of the Control	11/	4 11	1+10	1 12	1+4	+ 10	1 10.5	<u>+11</u>	j
				le #2					
Surface Finish,	AA 40	-50 R	· en.			Bluing	Pin Rollo	out	
Protrusion, in.		5,			-			E2 3 2	~
Perpendicularit								<i>P</i> '' ''	**
Longitudina Flush Gage Read	in in	rransve	الله اله اله اله اله اله اله اله اله اله		-			1	
		: 255	)		-		70:	1 1	
Capacitance Gag Exit Bur Heigh	it, in.	.016			-		,	المروا أ	
	Δ	ir Gage	Readings	(.0001 i	<u>n.)</u>				
		Angu	lar Posi	Lion				1	,
Axial	00	45°	90°	135°	180°	225°	270°	315	-
Position		40	30	133	100	223	270	310	į
Bottom #1	1 3	4.5	+ 3,5	+4	+ 3	7 4	+ 3	4	
#2		11	14	+ 3.5	+ 3	13	+ 2		
#3	+ 4	+ 4	4 3	+ 1.5	7 2	+ 2	+ 2		
#4	AND DESCRIPTION OF THE PARTY OF	155	+5		1 1.5	+ /	7 3.5		
#5	1+12	1/2	1+/2	+ /2	1 + 12	+ /2	+12	1/3.5	

Test Se	eries	_ Quali	ty Varia	ble	BASE	LIME	- 5/11	CURVE		
Produce	e Good Hole Us	ing Fol	lowing (	Condition	15:					
Tools:	Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)									
Spindle		325			Feed:	HAND	- 0.5	Tem		
Cutting	Fluid: ST	ADDAR	o Sol	WENT.	Depth	: (Ind.	Reading)	1.95	3	
Results	s: Specimen	No. 2	1)7 +	ŀ	lole #1 /	MAKED E	wa)			
Surf	face Finish, A	A 50-	62 11	·-	<u> </u>	MKKED E	Bluing	Pin Roll	out	
Prot	trusion, in.	118	7			• -	<del></del>			
Perp	pendicular ty,				,					
<b></b>	Longitudinal.	OCZ MC			NON.	•				
	sh Gage Readin					-				
Exit	citance Gage : Burr Height,	• -	011	78		-		6.		
	3	-			(.0001 i	n.)		(4.9	E 15.	
				lar Posi						
	Axial									
	Position	0°	45°	90°	135°	180°	225°	270°	315°	
	Bottom #1	+2.5	+ 2.5	+1	13	+ 1/	+ 5	, 5.5	+ 45	
	#2	+2	11	+1	72	+4	15	+ (	-3.5	
	#3	15	+3	+ 3	+2	72.5	1:1		4 4	
	#4	+7	+4	+45	+ 1	145	+ -	1 6,5	± 7	
	#5	+12	412	+/2	4 12	1/2	+ 1	+ 12	+ 12	
				Но	le #2					
Surf	ace Finish, A	A 42-	48.11		<del></del>		Bluing	Pin Rollo	out	
	rusion, in.								•	
	endicularity,									
<b>51</b>	Longitudinal	000			2 11.					
	h Gage Readin		(0)							
Exit	citance Gage Burr Height,	in.	011	10						
		Α	ir Gage	Readings	(.0001 in	n.)		, 3	=	
_				ar Posit						
	Axial	20			- 1	1000	225.	0700	23.50	
	Position	0°	45°	90°	135°	180°	225"	270"	315°	
	Bottom #1	+2	+ <	+3.5	+ 3	+2.5	+ 2	+1.5	+ 1	
	#2	+ 2:	13,0	+ 4	+ 4	4 2.5	12	+2	+ 1.5	
	#3 12.5 1 = +0 + 1 + 1.5 10.5 + 1 + 2									
	#4	+5	1 5	+ 3	+ 2	4 1.5	<del>1</del> 1	+ 11 5	+ 4.5	
(	#5	+11.5	+12	+11	+/2	+ //	+ 12	+ 11.5	THIS	

Test Series		_ Quali	ity Varia	able	PASE	11015 -	· 5/0/	10 1 1		
Produce Goo Tools: #2 Spindle, rp Cutting Flu	Centerdr m	111; 19/ 325	64 in. s	ent	III; Grou Feed Depti	: <u>#840</u> - h: (Ind.	- 0.5 [ Reading)		LD2040AR1-	-5)
Results:				!	dole #1 (*	17777	er)			
Surface	rinish, <i>i</i>	AA	-65 A	<u> </u>			Bluing	Pin Roll	lout	
Protrusio Perpendio	on, in.	001	2 /0200	length		-				•
					ביי אוריי					
Flush Gag	ne Readir	ng. In.	. 004	/		-				
Capacitar	nce Gage	Reading	3.1	<u>(                                     </u>		-		<b>a a</b> /1/		
Capacitar Exit Buri	r Height	, in	2/7	<u> </u>		<del>-</del> -		80%	11	
		A			(.0001 i	n.)			1	
,		· •	Angu	ar Posi	tion	<del></del>		Ţ	·	• 1
	cial sition	0°	45°	90°	135°	180°	225°	270"	315°	
Bot	tom #1	4 2	+ 1.5	. / 5	1.0	+ 7	1 =. 4	13.	+3	1
	#2	+ 2	+0		4	- 2		+ 4	1 3,5	1
	#3	+ 2	+ /	· /	,	· 1	1 4		1 2	1
	#4	+4.	+ 3	' 2	11.5	4.1	+ 2.5	1 4	4.5	]
<u> </u>	#5	+ 10.5	+ 10.5	+ 10.5	+12	7 10	1 15.5	111	+ 11	J
Surface F Protrusio Perpendic Longi Flush Gag Capacitan Exit Burr	n, in. ularity, tudinal, e Readin	.001 in g, in. Reading:	n./gage Transve	length rse 12	le #2		Bluing	Pin Roll	out	j -,
		A			(.0001 i	<u>n.)</u>			1	
F A2	ial	<del> </del>	Angul	ar Posi	ion	· · · · · · · · · · · · · · · · · · ·		,	<del> </del>	ı
	ition	0°	45°	90°	135°	180°	225°	270°	315°	
Bot	tom #1	1 1.5	<u> 12.5</u>	+2.5	4 3	-: 1	11.5	4 /	+ 2	
	#2		+ 2.5	43	1 2.5	1 /	1 0.5	<u> ۱</u>	+ 1	
	#3	+ 3	+ 1	41.5	+ 0.5	4.1	1 0.5	2	1 2	
	#4	+5	14	14	4 1	11	10.5	بنبات الم	+ 4	
	#5	111	1 11.5	+ 11.5	+ 11	+ 11	+ //	1 11	<del>†                                    </del>	

Test Series	Qual	ity Vari	able _	BASE	LINE	- 5//	V 50F	<u>, L</u>	<b></b>
Produce Good Ho Tools: #2 Cente Spindle, rpm Cutting Fluid:	le Using Forerdrill; 19/	/64 In. <sub>I</sub>	Conditio pilot dr	ns: TTI; Grou Feed Dept		k Drill R 		LD2040AR1	-5) -
	h, AA <u>25</u> - n. ,/e ity, .001 i nal . <u>w</u> 4/wc	32// 5 n./gage µTransve	length erse		(MARKED	END) Bluing	Pin Rol	lout	, , , , , , , , , , , , , , , , , , ,
Flush Gage Re Capacitance G				:0/	PASTER BLUI	·.i		• .	<b>*</b>
Exit Burr Hei	ght, in.					4	75:,		.!
	V		Readings lar_Posi	tion	<u>in.)</u>			·	
Axial				1				1	1
Positio	n 0°	45°	90°	135°	180°	225°	270°	315°	_
Bottom		. 2	+2	+ 1	÷ 1.5	+ 1.5	+ 2	+2	
	#2 /	===	11.5	t 1.5	1 /.5	12	+ =	4 7	
	#4 + 4	= =	1 2.5	+ 2.5		1 + +	+ /	1 3.5	-
	15 19	1 9.5	+ 4	17	13	1 8	79	+9.5	
						_			
				le #2					
Surface Finis		35 ME	()		-	Bluing	Pin Roll	out	
Protrusion, in Perpendicular		n./gage	length		-				
Longitudi	nal .so i/w			LINCH	_				
Flush Gage Rea	ding, in.	.00	4				,	1	
Capacitance Ga Exit Burr Hei	nge Reading ght, in.	35.	<u></u>		S. AFTER	" (D:N) ( )	0 3	,	þu
			Readings	(.0001 i	n.)				,
<del> </del>		Angul	ar Posi	ion				<b>+</b>	
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
Bottom #	1 + 1.5	+- /	+1	7 /	+ 1.5	+ 1.5	12	- 2	1
<del></del>	2 + /	<u> </u>	-1.5	12	1 2	+ 2	1 1.5	2	
	3 + 2.5		7 7	+ 1.1.	3 0.5	- 1.5	1 2.5	1 2,5	-
	4 + 3.5	+ 7	1 7	+ 7.5	<u>. م. د.</u>	- 6	65	. 4	1
\ <del></del>		<del></del>						1	L
								4	*
						H	ole 1		•
						_	• •		1

Test Se	ries	Qual	ity Vari	able	SASE	LINE	- 5/N	2000	/ <del>E</del>
Tools: Spindle	#2 Centerdr rpm 2/2 Fluid:	111; 19,	Howing /64 in.	Condition pllot dr	III; Grou Feed	: Mert	k Drill R , (° , ' Reading)	111	LD2040AR1-
Results Surf Prot	: Speciments ace Finish, in the contraction of the	AA :	2-50		tole #1	_	Bluing	Pin Roll	lout
Perpo Flust Capac	endicularity Longitudinal h Gage Readi citance Gage Burr Height	, .001 i <u>•c&gt; //e.</u> ng, in. Reading	n./gage Transve√ <u>≃ ده ،</u>	erse <u>. 60 ;</u>			70!	?/s	
		V		Readings		in.)			T.
ľ	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4	- 7- + 1.5 - 1.5 - 2 + 0	+2.5 + 4.5 + 4 + a	+ 1.	+ 2 + 2 + 3 - 3,5	+ ! + ! + ! + ! + !	+ 2.	1 1.5 1 1.5	+ 2 + 2,5 + 2.5 + 3 + 6
Protr	ice Finish, A	. 178	c - 6	Mo ()	le #2	-	Bluing	Pin Roll	out
Flush	endicularity, ongitudinal Gage Readin itance Gage Burr Height,	.003/NICH g, in. Reading in.	Transve	rse <u>co</u>	36	-	uznig.	10%s	
		A		Readings		<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225"	270°	315°
-	Bottom #1	‡ <del>?</del>	1 1.5	4 1.5°	+ 1.5	† 1.5 † 2	+ 1.5	<del>† 2</del> + 2	+ 1.5
+	#3	+ 3,5	+ 2.5	+ 2	21.5	1/	† <u>i</u> † <u>2</u>	† 1.5 † 3	+ 1
	#5	+8	+ 7	+ 5.5	15	+5	+6	+ 11	<del>+</del> 7

INSPECTION SHEETS FOR TEST SERIES 2 - INTERFERENCE

Test Series 2 Quality Variable INTERFERENCE (.CCC5)	
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040ARI-Spindle, rpm 325 Feed: Hand - 0.5 1PM Cutting Fluid: \$7000ARD SOLVENT Depth: (Ind. Reading) 1.953	-5)
Modify Good Holes Using Following Conditions:  Tool: Green 2 CMARE DRILL REAMER  Spindle, rpm 325 Feed: HARD-C.51PM  Cutting Fluid: STODOARD SOLVENT Depth: (Ind. Reading) 1.500  Procedure: REAM GOOD HOLE, TENING, THEN REAM 162" DEFINE	κ'
Results: Specimen No.4C28 Hole #1  Surface Finish, AA 18-25 Mar. Bluing Pin Rollout  Protrusion, in	
Longitudinal, 003/mc4Transverse ,001/NC4  Flush Gage Reading, In. 000  Capacitance Gage Reading: 405	•
Air Gage Readings (.0001 in.)  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°  Bottom ##2 + 1 + 1	
Flush Gage Reading, in003 Capacitance Gage Reading: 420  Air Gage Readings (.0001 in.)	1
Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°  Bottom #/2 +0.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	!
£7+3 +3 +3,5 +3,5 +3,5 +3,5 +3,5	

Test Series 2	_ Quality Varia	able 1	NTERF	EKENC	E (.c.	(05)	
Produce Good Hole Us Tools: #2 Centerdr Spindle, rpm 3 Cutting Fluid: 57	111; 19/64 in. <sub>1</sub> 2.5	oilot dri	ll; Group Feed:	HAND	-0.5		
Spindle, rpm 32. Cutting Fluid: STA Procedure: REAR	OMARE DI	VENT	Feed: Depth	#/AAA (Ind.	Reading)	1 <i>PM</i> 1. <b>5</b> 0 1.6 2 DEE	REAMER
Results: Specimen Surface Finish, A Protrusion, in. Perpendicularity,	A 40-50 M.	en_	ole #1		Bluing	Pin Roll	<u>out</u>
	9, in	rse .003	INCH		70%		
Axial Position  Bottom #/2  #/5  #/6  Surface Finish, A Protrusion, in.	0° 45° 0 0 0 0 0 0 0 0 0 +1 +0.5	90°  - Q - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0		180° + 0.5	225°	270°	315°  0 0 0 0 1 0 + 1
Perpendicularity,	.001 in./gage  a/www Transve g, in. Reading:	rse <u>oa</u> c4 20			659	o	. į
Axial	i'	ar Posit	ion		2 <b>2</b> 5°	270°	315°
Position  Bottom M2  123  134  185	0° 45° 0 0 0 0 0 0	90°	135°	180°	00000	0 0	0 0
<b>#</b> 7	+1 +1	0	0	0	+1	+ 0.5	+ 1

Test Series 2	Quality Var	iable <u>I</u>	NTERF	EREN	E (.c	005)	
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm 3 Cutting Fluid: 57	ill; 19/64 in. 25	pilot dri	11; Group Feed	p 1, 0mar : <i>Hawo</i> h: (ind.	-0.5	IPM	
Modify Good Holes U Tool: GREEP 2 Spindle, rpm 32 Cutting Fluid: 57 Procedure: READ WHILE	CMARE DODORED SO	RILL R	Feed Depth	: <i>בא אמו</i> ה: (Ind. <i>או או</i> אנ	11 GRE	2 90	REAMER PER
Results: Specimer Surface Finish, A Protrusion, in. Perpendicularity	18-34-11 .028	<u></u>	ole #1		Bluing	Pin Rol	lout
	000 Transv	erse .004	A JINCH	-	9 <b>5</b> %	, 6	
	Air Gage	Readings	(.0001 i	n.)			
Axial	Angu	lar_Posit	jon		· · · · · · · · · · · · · · · · · · ·	1	1
Position	0° 45°	90°	135°	180°	225°	270°	315°
Bottom #X 2	+05 +1	+0.5	0	0	0	0	0
#2 3	U + 0.5		0	0	0	U	0
#1 5		- 0	0	0	0	0	0
#96	1+05 0	+ 0.5	0	10	l a	1 2	0
<b>#</b> 7	+4.5 +4.5		+ <b>4.</b> 5 le #2	++	+4	+4.5	+4
Surface Finish, A	A 30-38				Bluing	Pin Roll	out
Protrusion, in. Perpendicularity,		length					1
	000 Transv		1/insy		6.	Ø?	
Flush Gage Readin Capacitance Gage					80	70	i
capacitance dage	Reading:	53					
	A: # C200	Readings	( 0001 ;	-1			. 4
		lar Posit		··· <i>/</i> ·			
Axial Position	0° 45°	90°	135°	180°	225°	270°	315°
<del></del>	ļ	-					
Bottom # 7 2 # 2 3	+0.5 0	8	0	0	0	+ 0.5	+0.5
#34	0 0	0	+.0,5	+ 0.5	t. 0.5	+0.5	0
#8 6	+ 0.5 0	0	+ 0.5	+ 0.5	+ 0.5	0	+ 1
	1000	7					<del>+ - +</del>

Test Series 2 Qual	ity Variable	NTERF	EKEKC	E (.ce	(05)	
Produce Good Hole Using Fo Tools: #2 Centerdrill; 19. Spindle, rpm 325 Cutting Fluid: 570 DOA.		ill; Group Feed:	o 1, Omark : <i>ქეგე</i> n: (Ind.	-0.5	PM	
Modify Good Holes Using For Tool: GREVE & CMAR Spindle, rpm 325 Cutting Fluid: STODAK Procedure: REAM GOOWHILE NOT	SOLVENT	Feed: Depth	באבא באבו (Ind.	Reading)	1.490 1.490 0F 2 DEE1	REAMER
Results: Specimen No. 5 Surface Finish, AA 12- Protrusion, in03 Perpendicularity, .001	25 11 in	Hole #1	-	Bluing	Pin Rollo	out
Perpendicularity, .001 i Longitudinal . <i>001/mc</i> Flush Gage Reading, in. Capacitance Gage Reading	y Transverse <u>.00:</u> 	3//NCH	• •	90	<b>%</b>	
Axial Position  Bottom #72  #73  #84  #85  #86  7 +4  Surface Finish, AA /5-	22 // Cn 22 n./gage length Transverse ,00	135°  135°  0 0 0 +3.5  0le #2	180°  0  0  0  4	225°  -0 -0 + A5 -0 -1 Bluing	270°	315°
Axial	ir Gage Readings Angular Posi	(.0001 ir	<u>.)</u>			
Position 0°	45° 90°	135°	180°	225°	270°	315°
Bottom #1/2 0	+05 0	9	0	0	0	0
#84 0	00	0	0	0	6.5	
#86 0	0 0	0	1 5	0	0	3

Test Series 2	_ Quality Vari	lable <u>I</u>	NTERF	ERENC	E (.c	005)	
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm 3 Cutting Fluid: \$7	111; 19/64 in. 25		II; Group Feed:	o 1, Omarl <i>HAND</i> n: (ind.	-0.5	1PM	LD2040AR1-5)
Modify Good Holes U Tool: Gaer, 2 Spindle, rpm 32 Cutting Fluid: 57 Procedure: Read	CMAKE D	RILL K	FAMER Feed: Depth	<i>خاممها</i> ۱: (Ind. ۲، ۲، سر	M GKO	<u>ت</u> س	REAMER PLR
Results: Specimer Surface Finish, A Protrusion, in. Perpendicularity	1A 30-35 km	length	ole #1	-	Bluing	Pin Roll	out
Flush Gage Readir Capacitance Gage	ng, in	01		• - •	709	1	
Axial Position  Bottom #/2  #// #//  Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal Flush Gage Readin Capacitance Gage	Angu  0° 45°  + 1 + 1  0 0  0 0  1 0	90° + 1.5 0 0 + 1 Ho length	(.0001 i	180°  + 2 0 0 0	225°  +1.5 0 0 40.5 Bluing	270° + 1.5	315°  + 1.5  0 0 0 + 1  out
		Readings lar Posit	(.0001 in	<u>1.)</u>			
Axial Position	0° 45°	90°	135°	180°	225°	270°	315°
Bottom #72 #23 #74 #75	0 0	0000	0 0 0	0 0 0	0 0 0	+ 0.5	0 0 0
176	+3 +35	+4	+ 4	14	1 _0	14-	14

Test Series 2 Quality Variable LATERERENCE	( ( ( )
Produce Good Hole Using Following Conditions:  Tools: 12 Centerdrill; 19/64 in. pilot drill; Group 1, Omarl Spindle, rpm 325 Feed: Food Cutting Fluid: Standard Source Depth: (Ind.	k Drill Reamer (TLD2040AR1-5 R C.S. [174] Reading) 1.954
	Reading) 1.400
Results: Specimen No. 4638 Hole #1  Surface Finish, AA 30-38 M 40  Protrusion, in. 118  Perpendicularity, .001 in./gage length	Bluing Pin Rollout
Longitudinal 1003/West Transverse 1001/West Flush Gage Reading, in. 000 Capacitance Gage Reading: 380	70%
Air Gage Readings (.0001 in.)  Angular Position  Angular Position  Angular Position  Angular Position  135° 180°  Bottom 21 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	225° 270° 315° 0 + 0.5 + 0.5 0 + 1 + 1 + 0.5 0 0 0 + 0.5 + 0.5
Surface Finish, AA 32-40 kgs.  Protrusion, in. 125  Perpendicularity, .001 in./gage length  Longitudinal 000 Transverse .collings  Flush Gage Reading, in.  Capacitance Gage Reading: 4/4	Bluing Pin Rollout
Air Gage Readings (.0001 in.) Angular Position	and the second s
Axial Position 0° 45° 90° 135° 180°  Bottom 41 + 0.5 0 + 0.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	225° 270° 315° + 1 + 0.5 + 1 0 0 + 0.5 0 + 1 + 1
65 0 0 7 2.5 0 7 0.5	0 +0.5 +1

Test Series	2	Qual	ity Varia	able $\underline{I_{\Lambda}}$	TERFE	RENCE	(-cc2	3)	
Produce Good Tools: #2 Ce Spindle, rpm Cutting Fluid	nterdr 32	111; 19,	/64 in. s	pilot dri	ill; Group Feed	p 1, 0mar : <u> </u>	0-17.5	IM	
Modify Good F Tool: GAC Spindle, rpm Cutting Fluid Procedure:	(P 2 3 2 5 5 REA	DRAA DRAA M GO	ALK D. Sel	DRILL LIAI OLE	Fred Depth	i Education (Ind.	Reading) <i>ITH</i> G	KONP 2	REAMER
Results: S Surface Fi Protrusion Perpendicu Longit Flush Gage	nish, A , in. larity, udinal.	.001 i	11/ n./gage Transve	length	ole #1	-	Bluing 子ご	Pin Rol	lout
Axi Posi Botte		A		90°  0  10  10  10  10  10  10  10  10  1	135°	180°	225° 0 1.0.5 1.0.5	270°  4 0.5  + 0.5  + 0.5	315° + 0.5° + 0.5° + 0.5°
Surface Fin Protrusion Perpendicu Longito Flush Gage Capacitance	, in.  arity,  dinal,4  Readin	.001 in.	n./gage yTransver	length rse <u>.00</u>	7//NCH		Bluing 70	Pin Roll	out
Axia		<u>A</u>	ir Gage F Angul	Readings ar Posit	(.0001 in	<u>n.)</u>	i ———	1	<u> </u>
Posit	ion	0°	-45°	90°	135°	180°	225° + 0.5	270° + /	315° + /
	#2 #3 #4	+ 0.5	+ 0.5	000	0	000	0	+0.5	+ 0.5
1	#5	Λ	0	(1			7	1	2

Test Series 2 Quality Variable INTERFERENCE (CC23)
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5 Spindle, rpm 325 Feed: Hand-C.5 [PM]  Cutting Fluid: Stondard Scauer Depth: (Ind. Reading) 1.954
Modify Good Holes Using Following Conditions:  Tool: GROUP 2 OMALK DRILL - REAMER  Spindle, rpm 325 Feed: HAND C.5 IPM  Cutting Fluid: 370 DPAND SCLVENT Depth: (Ind. Reading) 1.400  Procedure: REAM GOOD HOLE, TOUCH UP WITH GROUP 2 REAMER  WHILE NOT ROTATING, THEN REAM .080" DEEPER
Results: Specimen No. 4048 Hole #1  Surface Finish, AA 20-30 Augus Bluing Pin Rollout  Protrusion, in
Air Gage Readings (.0001 in.)  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°  Bottom #1 + 0.5 + 0.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Surface Finish, AA 38-94 M Bluing Pin Rollout  Protrusion, in. / 08  Perpendicularity, .001 in./gage length  Longitudinal.oo//wc/ Transverse .002/WC/  Flush Gage Reading, in. 003  Capacitance Gage Reading: 379
Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°  Bottom #1 +0.5 0 0 0 0 0 0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

Test Series _ 2	Qual	ity Vari	able $\underline{\mathcal{L}}$	VIERFE	RENSE	(.002	3)		
Produce Good Hole Tools: #2 Center Spindle, rpm	drill; 19	/64 in.	pilot dr	iil; Grou Feed	p 1, 0mar l: <u> </u>	0.0.5	IFM		-5)
Modify Good Holes									
Tool: Graup Spindle, rpm	2 On	ALK	DRILL	-KeAA	HAN		· 1 PM1		
Cutting Fluid: 3	TODRAN	o Sek	VEA'T		h: (Ind.		1.40	0	
Procedure: RE	AM GU	GO A	TING	Truck	V KEAN	17H G	KONP Z	KEAMER EL'ER	7
Results: Special	, AA 10	-90		lole #1	_	Bluing	Pin Rol	lout	
Protrusion, in Perpendiculari			length						
Longitudin	1 .003/NC	y Transve	erse .002	/MCH	<del>.</del>	0.	%		14
Flush Gage Read Capacitance Gag			170		_	00	10		i
	,				-				
	Α	ir Gage	Readings	(.0001	in.)				
	• 7		lar_Pos.i.t		·•		. •		-1
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	1
7037(10)								1 313	1
Bottom #1		# 1	0	1.0.5		0	+ 0.5	+!	-
#2		+0.5	0	+ 0.5	+ 0.5	121	+ 0.5	+ 1	┨
#4	- 8	0	0	t. 1_	t. 1	+05	0	0	1
L#5		140.2	1 6.5	I. I. D.S.	·	L. Q	<u>o</u>	1+0.5	]
Surface Finish,	AA 30 =	45	Ho	le #2		Bluina	Pin Roll	out	
Protrusion, in.		115			•				-
Perpendicularit	y, .001 ii	n./gage	length	Lucu					
Longitudina Flush Gage Read	ing, in.	Wiransve .00	2	IMCH	_	70%			:
Capacitance Gag	e Reading		22			, ,			1
								4	
	<u>A</u>		Readings		<u>n.)</u>				
Axial		Angul	ar Posit	ion	1			T	
Position	0°	45°	90°	135°	180°	225°	270°	315°	
Bottom #1	+0.5	0	0	0		0	0	0	
#2	+0.5.	0	+ 0.5	_0	0	. 0	0	0	
#3		0.	+.0.5.	0	+ 0.5	0		0	
#4		0	0	0	4 0.2	+ 0.5	+0.5	+0.5	

Test Series 2	Quality Var	lable $\underline{\mathcal{L}}$	NTERFE	NEN CE	(.002	3)	<del></del>	
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm 32 Cutting Fluid: 5	111; 19/64 in. 5	pilot dr	III; Grou	p 1, Omarl : <u> </u>				-5)
Modify Good Holes Use Tool: GAGLE 2 Spindle, rpm 3 a Cutting Fluid: 57 c Procedure: REA	CHARK	DKILL LIN'S LOKE	-Kean Feed Dept	: <i>Efgal</i> h: (Ind.	Reading) (711 G	KOUP Z	MEACIEN	የ
Results: Specimer Surface Finish, A Protrusion, In. Perpendicularity,	1A 18-34 W	m	lole #1	-	Bluing	Pin Rol	lout	
	003/wc# Transv		INCH	- - -	70%	6		İ
Axial Position  Bottom #1 #2 #3 #4 #5		90°	(.0001 i	180"	225°	270°	315°	
Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Readin Capacitance Gage	.001 in./gage .001 in./gage .001/WCH Transve g, in.	length	le #2		Bluing 70%	Pin Roll	<u>out</u> !	5.
	Air Gage		(.0001 i	<u>n.)</u>				ļ .
Axial Position	0° 45°	90°	135°	180°	225°	270°	315°	
Bottom #1	0 0	0000	0	0000	0	0000	0 0 0	
15		I U		0	Ω	<b></b>		

Test S	eries 2	Quali	ty Varia	ble	INTE	RFEREN	UCF (	.0035	
Tools: Spindle	#2 Centerdrie, rpm	sing Fol III; 177 12.5	lowing C 64 ln. p	ilot dri	Tl; Group Feed: Depth	: (Ind.	Reading)	eamer (TL	.D2040AR1-5)
Sur! Pro!	s: Specimer face Finish, A trusion, in. pendicularity,	A 45	-5512	<u> </u>	ole #1	;,, \ \	) Bluing	Pin Roll	out .
Flus	Longitudinal sh Gage Readin acitance Gage t Burr Height,	Reading	, Transve <u>. ००</u> ९ : <u>३</u> २,	rse <u>00</u>		- - -		1.^ `s	F
		<u>A</u>		keadings ar Posit	(.0001 i	<u>n. /</u>			· E.
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4 #5	+ 2.5 + 1 + 2 + 3.5 + 10	+ 1.5 + 1 + 2 + 3.5 + 10	+1 -1.5 -1 -2.5 -2.5	1.5 1.5 1.2 1.2 1.3 1.3	1 2 1 15 1 15 2 15	+ 2 + 1 + 1 + 1 + 9	+ 2.5 + 1.5 + 1.5 + 1.5 - q	1 2 1 1.5 1 3 1 7.5
Prot	face Finish, A crusion, in pendicularity,	.001 1	n./gage	length	le #2		Bluing	Pin Roll	out .
	Longitudinal sh Gage Readin scitance Gage t Burr Height,	g, in. Reading in.	3.75				С.	•	
		<u>A</u>			(.0001 1	<u>n.)</u>		٠.	
	Axial Position	0°	Angu 45°	ar Posi 90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4	. 1.5	† 1 † 1.5 † 2.5 † 7	73727	+ 1 + 2 - 1 + 1 + 6.5	+ 1 + 1.5 + 1 - 1.5 + 6	000-9	0 10,5 0 1: <b>5</b>	000

Test Series 2 Qua	lity Variable	INT.	ERFE	KEN	F (.C	2035)
Produce Good Hole Using 1 Tools: #2 Centerdrill; 1 Spindle, rpm 325 Cutting Fluid: 21,000	ollowing Condit	ions: drill; Group		CDrill R	camer (TI	.D2040AR1-5)
			_		Farker when tenden bee	har a timbra a di Maria di Andre Angelo Apundo
Results: Specimen No. Surface Finish, AA 3		<u>Hole #1 (</u>	rei :		Pin Roll	out
Protrusion, in. Perpendicularity, .001	<b>C</b> ,	h	-			
Longitudinal 000	Transverse .	223/101	an.			
Flush Gage Reading, in Capacitance Gage Readi Exit Burr Height, in.			_			. )
Exit Burr Height, in.	Air Gage Readin	ngs ( 0001 i	n )		~ 13.18 "	*
g againment dans in a and disconnective designation from	Angular Po		1.7	· · · · · · · · · · · · · · · · · · ·		
Axial Position 0°	45° 90°	° 135°	180°	225°	270°	315°
Bottom #1 + 1	4 1	1 5	+ /	4 5	11.	1 .
#2 + 1.5	+ 2	1 2.5	+ 2	2		1 1
#4 + 3	11.5 1 -	5 1 5 C	+ 4.5	+ 5		1.5
Surface Finish, AA 22 Protrusion, in. • 19 Perpendicularity, .001	3-35 M N.	Hole #2		Bluing	Pin Rolle	out
ريم کي د Longitudinal	Transverse c	333				
Flush Gage Reading, in. Capacitance Gage Readin Exit Burr Height, in.	9: <u>349</u>			Ç	•	
	Air Gage Readin		n.)			11
Axial	Angular Po					
Position 0°	45° 90°	135°	180°	225°	270°	315°
Bottom #1 - 2 #2 + 2	+ 2 + 3	4. 2.5	+ 2 + 2.5	+ 1	+ 1.5 + -	<u>사 사사</u> 보 사회
#3 4 2.5	+ 1.5 + 1	+ 5	+ /	: 1.5	4 <u>5</u> 4 <u>2.5</u>	5.5
#5 + 9	1 3.5 + 2 + 9	1 5.5	2 0.5 4 7.5	1.5	+ 8.5	1 2,5

Test Series 2	Qual	ity Vari	able	IN	TERF	EREN	ICE (	0035
Produce Good Hole U Toois: #2 Centerdr Spindle, rpm 3 Cutting Fluid: 5	111; 19.	/64 in. ;	pilot dri	III; Grou	p 1, Omarl :			
Results: Specime Surface Finish, Protrusion, in.	AA	5-60 M	٤ ،	lole #1 (	MARKET E - -		Pin Roll	out
Perpendicularity Longitudinal Flush Gage Readi Capacitance Gage Exit Burr Height	<u>.002</u> ng, in. Reading , in.	Transve . 00 1: 330 . 0/1	erse <u>.</u> / Readings	(.0001	<del>-</del> -	7	07	l
Axial	0°	45°	lar Posit	135°	180°	225°	270°	315°
Bottom #1 #2 #3 #4 #5	+ 2 + 2 + 2 + 3 + 7	+ 2 + 2 + 1 + 2 + 6	1 11 1 1 2.5 2 1 1 4	+ 1 + 1 + 1.5 + 2	1 2.5	+ 3 + 0.5 + 1 + 5.5	+ = .1 + .1 + .1 + .1 + .5 + .6	1 · · · · · · · · · · · · · · · · · · ·
Surface Finish, A Protrusion, in.	. 15	2	o	1e #2	-	Bluing	Pin Rolle	out
Perpendicularity, Longitudinal Flush Gage Readin Capacitance Gage Exit Burr Height,	9, in. Reading	Transve 3/0	rse	(.0001 i	n.)		60%	
Axial Position	0°	_	90°		180°	225°	270°	315°
Bottom #1 #2 #3 #4 #5	+ 3 + 3 + 5 + 10.5	+ 2.5 + 2 + 1 + 3 + 10	+ 3 + 3 + 2 + 2 + 2 1 /0.5	+ 5 + 2.5 + 2.5 + 2.5 + 2.5 + 2.5	+ 2.5 + 2.1 + 1.5 + 1.5 + 10	+ 3 - 2.5 - 1 - 1 2 - 10	- 3 + 3 + 2.5 + 5 + 10.5	+ 3.5 + 2.5 + 10

26

Test Se	eries 2	Quali	ty Varia	ble	IN	TERF	FREN	CE (	0035		
Produce Tools: Spindle	Good Hole Us	ing Fol	lowing C 64 in. p	ondition lot dri	is: 11; Group Feed:	o 1, Omark	Drill R	eamer (Tl	.D2040AR1-	5)	
Results: Specimen No. 6AGT Hole #1 (MARKED END)  Surface Finish, AA 50-60 M M Bluing Pin Rollou  Protrusion, in											
Perp	pendicularity, Longitudinal, th Gage Readin	.001 i	n./gage Transve	rse <u>.00</u>	a	- - -					
Capacitance Gage Reading: 300 Exit Burr Height, in. Air Gage Readings (.0001 in.)											
			Angul	ar Posit	ion						
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°		
	Bottom #1	7 2.5	0.5	+ 2	<i>↓ 2, &lt;</i> -	+ 2.5	7 9	+ 4	4 3		
	#2	+2.5	0.5	1 2,5	1-2-	+ 3.5°	- 4	1 5	+ 3		
	#3	2.5	_ 2	- 2.5	1-1-	1_4_	0.5	- 2.5			
	#4	- 3	3.5	4 2.5		21-		* 3	1 5		
	#5	+ 11.5	11.5	- 11.5	1 11.5	1 11.5	1-1:5	+ 45	1 + 11.5	l	
Surface Finish, AA 45 55 Le 22 Bluing Pin Rolle Protrusion, in/97 Perpendicularity, .001 in./gage length Longitudinal .c.//w. Transverse .c. 4/w/. Flush Gage Reading, in004											
Capacitance Gage Reading: 332											
Air Gage Readings (.0001 in.)											
			Angul	ar Posit	ion				• 1		
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°		
	Bottom #1 #2	+ 2.5 + 2	+ 2	† 1 † 2	0 + 1.5	+ .j.< + /	- 1 - 1	+ 2.5	+ 2		
•	#3	- 2.5	· 1	4 /	+ /	4 ]	12.5	7 /	- 1.5		
#4 - 5   1 3.5   1 3   + 1.5   + 1   1 0.5   1 2   1 3.5									1:5		
	#5	- 9	+ 7.5	1 10							

Test Series 2	Qual	ity Vari	able	IN	TERFE	REN	CF (.	0035	)
Produce Good Hole I Tools: #2 Centerdo Spindle, rpm Cutting Fluid: 57	riii; 19. 32€	/64 in. <sub>1</sub>	pilot dri	ns: Ill; Group Feed	p 1, Omarl	c Drill R	eamer (Ti		5)
Results: Specime Surface Finish, Protrusion in	AA 58-	65/4 m	<u>.                                    </u>	lole #1	(MARK)	Er/) Bluing	Pin Roll	out	
Protrusion, in									
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
Bottom #1 #2 #3 #4	0 -0.5 +1 +7	+ 2 + 2 + 1.5 + 2 + B	+ ! + !	+ 2 + 2 + 2 + 2 + 7.5	+ 1.5 + 1.5 + 1.5 + 7.5	+ 2.5	+ 2 + 2 - 5 - 5 + -	+ 2 + 2.5 + 2.5 + 8	
Surface Finish, AA 30-40 Man Bluing Pin Roll Protrusion, in. 202 Perpendicularity, .001 in./gage length Longitudinal colline Transverse .00 Flush Gage Reading, in003 Capacitance Gage Reading: 366 Exit Surie Helicia, 16013 Air Gage Readings (.0001 in.)									3
Axial Position	0°	Angu 45°	er Posit	ion 135°	180°	225°	270°	315°	
Bottom #1 #2 #3 #4	+ 2 + 1 + 1 + 2 + 4	† 1 0 0 1-2 † 5	+ 2 + 1.5 + 1 + 2 + 5	+ 1 0 + 0.5 + 1.5 + 4	+ 2 + 1 + 1 + 1 1 2.5	+ 1 + 0.5 + 0.5 + 1.5 + 4	+ 2.5 + 1 0 + 1 + 3	+ / 0 + 25 + 25 + 5	

Test Se	ries $2$	Qual	ity Varia	able 1	NIERE	EREN CE	- (.00-	18)	<del> </del>
Tools: Spindle	#2 Centerdr	111; 19. 25	/64 in. p	oilot dr	III; Grou				
Tool:	LINDERSIZE	= ON	PACE L	PRILL -		12			
				<del></del>					
					-				54
rocedu					IHE		SIIXK	WITH	<u>,                                      </u>
	LNUE	2/26	\_AEC	MER	· · · · · · · · · · · · · · · · · · ·	<del></del>	<del></del>		
Results	: Specimen	No. 4	= 4 1		ole #1		01	n:- n-11	
Prote	ace rinish, A	w <u>-35</u>	-95 M	4.γ		-	bluing	PIN KOTI	out
Pern	endicularity	001 i	n loage	length	······································	-			
					LINCA		000	,	
Flush	h Gage Readin	g, in.			<u> </u>		80%	•	
Capac	citance Gage	Reading	:			-			1
									i
		٨	: m C 2 0 0	Dondinas	( 0001 :	n 1			
		7				11. /			
Ī	Avial	1	Angu i	1	. 10)1		· · · · · · · · · · · · · · · · · · ·	1	1
		0°	45°	90°	135°	180°	225°	270°	315°
			-						+
į	Bottom #1	. 0	+ 0.5	0	0	0	-0.5	0	C
	#2	0	0	*	0	Q.	- 0.5	0	C
	#3	1-4-1	0_	0	Q	0	0		0
		+-1	+0.5	<del></del>	0			Q	1-0
ı	#5	L	<u> </u>	<u> </u>	. L			Married Married Company	4
				Но	le #2				
Surfa	ce Finish, A	A 38-	124 L			_	Bluing	Pin Roll	out
						•			
					_ /			1	F
L	ongitudinal	002/11/5			3/11/04		_		
						1	رُّ ن <del>ئ</del> ي	is i	
Capac	itance dage i	reauting	·	, ,		•			1
	Rottom #1								
•	many way or granded as a		Angul	ar Posit	ion	·	-	·	,
j		00	AEO	000	1250	1000	2250	2700	3150
	rosition	U.	45	30	133	100	223	2/0	
	Bottom #1	0	0	0	0	D	0	0	C
t									0
Ţ		. 0							
1.	#4					0			+ 0.5
i	#5							i	1

Test Series Quality Variable INTERFERENCE (.0018)								
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040/Spindle, rpm 325 Feed: HAND -0.5 IPM Depth: (Ind. Reading) 1.905	AR 1 – 5)							
Modify Good Holes Using Following Conditions:  Tool: UNDERSIZE CHARE DRILL - REAGNER  Spindle, rpm 325 Feed: HAND -0.5 IPM  Cutting Fluid: STEDDARD SOLVENT Depth: (Ind. Reading) 1.954  Procedure: REAM HULE SHALLOW, THEN CO'SINK WITH  UNDERSIZE REAMER								
Results: Specimen No. 586T Hole #1  Surface Finish, AA 55-65 Bluing Pin Rollout  Protrusion, in236								
Perpendicularity, .001 in./gage length  Longitudinal .003/wow Transverse .005/wow  Flush Gage Reading, in002  Capacitance Gage Reading: 387	1:							
#2 0 C 0 0 0 1 0.5 + 0.5	<u>5</u>							
Surface Finish, AA 45-55 // Bluing Pin Rollout Protrusion, in	<b>p</b> .							
Longitudinal <u>out factor</u> Transverse <u>co8 kwcw</u> Flush Gage Reading, in. <u>CO1</u> Capacitance Gage Reading: <u>392</u>	1							
Cools   2   Centerdill;   19/64   in. pilot drill;   Group   1, Omark Drill   Reamer   TLD2040ARI-5    pindle, rpm   3   25   Feed:   HAND - 0.5   IPM   Depth: (Ind. Reading)   1, 9   5								
Axial	,							
13 0 0 0 0 0 0 0 0								

Test Series 2	Quality Vari	able <u> </u>	NTERF	ERENCE	- (.00	18)		
Tools: #2 Centerdrill Spindle, rpm 325	19/64 in.	pilot dr	iil; Grou Feed	: HAND	-0,5	IPM		)
Modify Good Holes Using	Following	Condition	ns:					
		DRILL -		2				
		1:5-4=		- HAND	Reading)	1 PM	50	
Procedure: REAM	Description   Description							
LINDERS	ZE KE	MER						
·								
					· · · · · · · · · · · · · · · · · · ·			
Counting Fluid:   STADDAKE   Solvent   Depth:   (Ind. Reading)   1,905								
Protrusion, in.	222	<b>a</b> t		-	3.0			
Longitudinal .001	Inch Transve	erse <u>oo</u>	<u> </u>	-	809	3	1	
Capacitance Gage Rea	ding: 3	70		-			= 1.	
		<del></del>		•			1.	
	A:= C200	Pandings	( 0001 ;	n )				
				<u>''. /</u>				
		1	, , , , , , , , , , , , , , , , , , , ,			Ï		
Position	0°   45°	90°	135°	180°	225°	270°	315°	
Pottom #1		1		^		, ,	1. /	
						1	+5-;	
	1 + 1	± 1	05		4 0.5	-1	1 0.5	
	1.5 1 1.5	+ 1.5	0	0	±.1	+ 1	+ 1.5	
L		ــــــــــــــــــــــــــــــــــــــ		<u> </u>	.L		4	
		Но	le #2					
Surface Finish, AA	36-44 N				Bluing	Pin Roll	out	
		1						
			March					
Flush Gage Reading.			JINGA.	•	50%		ı	
							. !	٠
	Air Gage	Readings	(.0001 i	n.)				
	Angul	ar Posit	ion					
1 .				1000	2250	2700	2150	
Position	45°	90"	135°	180	225	2/0	315	
Bottom #1 + 6	5 + 1	+1	+1	0	0	0	+0.5	
#2 + 6		+ 1						
		1.9.	1 0.5			+ 0.5		
#5		<del>                                     </del>	70,5	1.0.2	7 6.2	1.00	1.0.5	

Test !	Series <u>2</u>	Qual	ity Vari	able	NIERF	FRENCE	- (.00	18)				
Tools: Spind	te Good Hole U  #2 Centerdr  le, rpm 3 2  ng Fluid: 57	ill; 19 25	/64 in.	Condition pilot dr	ill; Grou				LD2040AR1-5)			
Tool: Spindl Cuttin	Good Holes U  VNDERSIZ e, rpm g Fluid: 57 lure: REAM LNDE	E ON 25 CORAR 1 HUL	D SOL	VENT	<i>KEAME</i> Feed Depti	HAND (Ind.						
Sur Pro Per Flu	Surface Finish, AA 38-42 m Bluing Pin Rollout Protrusion, in225 Perpendicularity, .001 in./gage length Longitudinal confirm Transverse of June 4 Flush Gage Reading, in003 Capacitance Gage Reading: 317											
	Axial Position  Bottom #1 #2 #3 #4		ir Gage	Readings lar_Rosit 90°	(.0001 i	180°	225° 0 0	270°	315°			
Prot Perp Flus	ace Finish, A rusion, in. pendicularity, Longitudinal ch Gage Readin citance Gage	.001 ii	42 n./gage Transver	length rse .004	1e #2		Bluing	Pin Roll	out :			
	Axial	<u>A</u> :		Readings ar Posit	(.0001 in	<u>1.)</u>		1				
1.	Position  Bottom #1 #2 #3 #4	0°	45° 0 0 0	90°	135° 0 0 0	180°	225°	270°	315°			
	#5											

Test Series 2 Quality Variable INTERFERENCE (.0048)

Modify Good Holes Using Following Conditions:  Tool: UNDERSIZE OMACK DRILL - REAMER Spindle, rpm 325	HAND - 0.5 IPM  (Ind. Reading) 1.905									
Results: Specimen No. 3857 Hole #1  Surface Finish, AA 38-44 44 M Bluing Pin Rollou.  Protrusion, in2.35  Perpendicularity, .001 in./gage length  Longitudinal .ool/wch Transverse .oo3/wch  Flush Gage Reading, in003  Capacitance Gage Reading: 410										
Axial Position 0° 45° 90° 135°  Rottom #1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.)  180° 225° 270°  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	315° 0 0 0								
Surface Finish, AA 35-44 MM Bluing Pin Rollout Protrusion, in242 Perpendicularity, .001 in./gage length Longitudinal ool/wewTransverse oo Flush Gage Reading, in003 Capacitance Gage Reading: 415										
Air Gage Readings (.0001 in Angular Position  Axial Position 0° 45° 90° 135°  Bottom #1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	180° 225° 270°  0 0 0  0 0 0  0 0 0	315°								

Test Ser	ies 2	Quali	ty Varia	ble	NTERE	EKENS	E (.c.	(0.2	<del></del>
Tools: Spindle,	Good Hole Us #2 Centerdri rpm 325 Fluid: 572	11; 19/	'64 in. p	ilot dri	11; Group Feed:	o 1, Omark :	-0.51		LD2040AR1-5)
	=		220			•	3.		
	ood Holes Us NDERSIZ					a <del></del> ar			
Spindle,	rpm <u>32</u>	5-			Feed:		-0.5	IPM	
Cutting	Fluid: ST	DOAC	n Soc	VENT	•	: (Ind.			4
Procedur	E: BEAN	1 Ho	E SI	MALLOW	1 , T/7	EN C.	SINK	WIT	<u>d</u>
	LIN DE Z								
Results:	Specimen	No 5	16B	Н	ole #1				
Surfa	ce Finish, A	A 25	35 W.s				Bluing	Pin Roll	out
Perpe	usion, in. ndicularity,	.001 i	n./gage	length		•			
Lo	ongitudinal,	005/101CA	Transve	rse .001	INCH	_	0.5	a)	
Flush	Gage Readin	g, in.	.00	<u>'</u>		•	80	10	
Capac	itance Gage	Keading	: 28	58		•			f
		A			(.0001 i	n.)			
Γ	Axial	1	I Angui	ar_Posit	. Юл	1	· · · · · · · · · · · · · · · · · · ·	i	1
1	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1	0	+.5.5_	+0.5	+ 0.5	0	-	0	0
	#2	+ 1	+ C.5	10.5	0	0	77	T -	+ 1
	#3_	+1-	+1-	+ 0.5		0_	0	1 0.5	111
<u> </u>	#4#4	<del>                                    </del>	¥ 33	773	± 3	±3.5	+ 3.3	7 5.3	+ 3.5
_		· · · · · · · · · · · · · · · · · · ·	•	<del>1</del> .			books and a property of		***************************************
	- <b>5</b> 1 A		-		le #2		Pluine	Pin Rolle	011¢
	e Finish, A usion, in.	40-		<u> </u>			Bruing	FIII KOTI	300
Perper	dicularity,	.001 ir	1./gage						<b>}-</b>
Lo	ongitudinal.	04/INCH			INCH		-10	0/_	·       ·
	Gage Reading tance Gage		30				/0	/ 3	
осрас.	tunes tage .			Δ					
		۸:	- Cana B	ondings	( 0001 :-	. ``			1
		<u>A1</u>	Angul	ar Posit	(.0001 ir	1.7			•
	Axial								-150
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1	+0.5	-1	+1	+1	0	0	0	0
	#2	0	0_	+ 0.5	+1	±l.:	+. /	0	0
-	#3	+ 0.5	+ 95	J. 0.5.	+25	. 0	1.0.5	+3	+ 1.5
	#5					+ 2,5	<b>7_6</b>		

Test Series 2 Quality Variable INTERE	ENERGE (cocso)
Produce Good Hole Using Following Conditions: Tools: #2 Centerdrill; 19/64 in. pilot drill; Grou Spindle, rpm 325 Feed Cutting Fluid: STADDARD SOLVENT Dept	p 1, Omark Drill Reamer (TLD2040AR1-5 : //// C.S / PM h: (Ind. Reading) //877
Modify Good Holes Using Following Conditions:  Tool: UNDERSIZE CHARK DRILL - REAR Spindle, rpm 325 Feed Cutting Fluid: STADDARD SOLVENT Depti Procedure: BEAM HOLE SHALLOW, THE	: 14NNP - 0.5 [PM
Results: Specimen No. 4C6T Hole #1 Surface Finish, AA 38-424444 Protrusion, in306 Perpendicularity, .001 in./gage length	Bluing Pin Rollout
Longitudinal Transverse 1003/124 Flush Gage Reading, in. 1004 Capacitance Gage Reading: 398	75%
Air Gage Readings (.0001 in Angular Position	180° 225° 270° 315° + 0.5
Surface Finish, AA 35-4544  Protrusion, in. ,292  Perpendicularity, .001 in./gage length  Longitudinal.out/pry Transverse .coG/NC4  Flush Gage Reading, in002  Capacitance Gage Reading: 410	Bluing Pin Rollout
Air Gage Readings (.0001 i Angular Position	n.)
Axial Position 0° 45° 90° 135° Bottom #1 0 0 0	180° 225° 270° 315°
#2 #3 0 0 0 0 +0.5	+ 0.5 + 0.5 - 0.5 - 0.5 + 1.5 + 1.5 + 1.5

Test Serie	s <u>2</u>	Qualit	y Vari	able	1. TERE	ENSN	CE (.0	06.0)			
Tools: #2 Spindle, r	od Hole Usi Centerdril pm 325 uld: Stal	1; 19/6	4 in.	pilot dr	111; Grou Feed	p 1, Omar :	0.5	PM	LD2040AR1-5)		
Tool: //	Holes Usi DERSIZE OM 326 Ild: STO NEAM UNDER	- (1)		120.4	Kilma	M&K : <i>i∃AAA</i> h: (Ind. :€A ⊆	Reading)	1.95 1.95 W17	1 H		
Surface	Specimen I Finish, AA on, in.	38-45	Tum	-	dole #1	- -	Bluing	Pin Roll	lout		
Long Flush Ga	Protrusion, in292 Perpendicularity, .001 in./gage length  Longitudinal .002/wcy Transverse .001/wcy Flush Gage Reading, in003 Capacitance Gage Reading: 355										
	Air Gage Readings (.0001 in.)										
	xial sition	0°	Angul 45°	ar_Positi	135°	180°	225°	270°	315°		
Bo	#2 #3 #4	0005	t 0.5 0.5 + 1 + 35	†0.5 0 13.5	10.5	+ 0.5	+ 0.5	+ 0.5 -0.5 0 1 4	† 0.5 0 0 7 3		
Surface	Finish, AA	40-5	Dur		le #2		Bluing	Pin Rolle	out		
Perpendid Long Flush Gag	on, in. cularity, . itudinal.eog ge Reading, nce Gage Re	OOI In.	gage	'se ,004	-/wcy		، در ان ان ار ان	)			
		Air		leadings ar Posit	(.0001 li	<u>1.)</u>			•		
	ilal	0°	Angui 45°	90°	135°	180°	225°	270°	315°		
	tom #1 1	0.5	-1-0.5	+1.5	+ 0.5	+0.5	+ 0.5	0	0 0 + 0.5		
	15				7/13	I	7- 4	+ 1.5	T_£		

Test Series 2 Quality Variable INTERFERENCE	(.0000)								
Cutting Fluid: STORDARD SOLVENT Depth: (Ind. Re	eading) 7.954								
Results: Specimen No. 2D/T Hole #1  Surface Finish, AA 35-44-10-10  Protrusion, In	Bluing Pin Rollout  90%								
13 17 11 0.5 9 17 0.5 17 0.5	1 0.5 1 0.5								
Policy Programmer (TLD2040AR1-5) feed: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5) indle, rpm 325 feed: #AAD OS (IM)  Depth: (Ind. Reading) 1, 9-17  Hiffy Good Holes Using Following Conditions:  Dit L'NDERSIZE OMARK DRILL NEADER  Dit Conder DRILL NEADER  Feed: #AAD OS (PM)  LINDERSIZE OMARK DRILL NEADER  Depth: (Ind. Reading) 1, 95 4  Depth: (Ind. Reading) 1, 95									
Angular Position  Axial Position $0^{\circ}$ $45^{\circ}$ $90^{\circ}$ $135^{\circ}$ $180^{\circ}$ Bottom #1 $+1$ $+1$ $+1$ $+1$ $+1$ $+1$ $+1$ $+1$	0 0 c t 1 + 0.5 + 0.5 + 1 + 0.5 10.5								

Test	Series $2$	Qual	ity Vari	able	NTERE	EKEN	CE (10	060)	
Tools Spind	ce Good Hole U : #2 Centerdr le, rpm <u>32</u> , ng Fluid: <u>St</u>	111; 19. 5	/64 in. (	pilot dr	111; Grou Feed	p 1, Omar : <i>[[]] M</i> h: (Ind.	-0.51	PM	
	y Good Holes U								
Tool:	LNDERS/Z le, rpm 32	E ()				NOR ITAN	0 -: 17 4	TPM	
Cuttir	ng Fluid: ST dure: BEAA	ODDAC	n Sac	VENT	Dept	h: (Ind.	Reading)	1.95	
110000	UNDE	NSIZ	E RET	AMER	4 , 12	EN C	SINK	WIT	
Sur Pro	s: Specimer face Finish, A	A 36	-45 M	in_	Hole #1	- -	Bluing	Pin Roll	<u>out</u>
	pendicularity Longitudinal	.003/INC	Transve	rse . 144	lines	_	٥.	0-1	1
Flu Cap	sh Gage Readir acitance Gage	ng, 'in. Reading	-002 34	4		<u>-</u>	90	70	1
		<u>A</u>		Readings ar_Posi	(.0001 i	<u>n.)</u>			
	Axial	0°	45°	90°	135°	180°	225°	270°	315°
	Position	-			135				313
	Bottom #1 #2	+ 0.5	0 - 5 - 5 - 5 - 6 - 6 - 6 - 6 - 6 - 6 - 6	+ 05	+ 0.5	-0-	+ 0.5	1 0	+ /
	#3	1 15	+ 1.5	± 1	† 0.5 † 3.5	+3	+ 0.5	1 65	<del>1</del> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	#5	1				Lizi			
Sur	face Finish, A trusion, in.	A <u>38-</u>	14 pc		le #2		Bluing	Pin Rollo	out
	pendicularity,					•			
Flus	Longitudinal, sh Gage Readin	9, in.	ransve		YINCH	•	500%	7	
Capa	acitance Gage	Reading	35	9			,	,	,
		Δ1	r Gage I	Readinos	(.0001_i	n.)		•	-
	parameter and an arrival	<u>n.</u>	Angul	ar Posit	ion	,	, <del></del>	· · · · · · · · · · · · · · · · · · ·	
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1	_0	0	0	0	0	+0.5	+0.5	0
	#2	-0.5.	+ 0.5	+ 0.5	+-1	+ 0.5	‡ /···	+ 0.5	-0.5
,	#4	+1.5	+ 1	+ 1	¥ 1	+ 1	<del> </del>	115	+ 1.5
	#5				L		l		

INSPECTION SHEETS FOR TEST SERIES 4, 5, AND 6

CRACK GROWTH TESTING

	мА	NUFACTU	ORT: T	TAPERED HOLES							
Test Se Specime	eries <u>4</u> en No. <u>363</u>	Qual	ity Vari	able _							
Hole Ma	nufacturing (	Conditio	ons and	Procedu	res: _	<del></del>					
	idle, rpm ing Fluid:				eed: epth: (I	Ind. Read	ding)				
Prot Perp L	ace Finish, A rusion, in. endicularity, ongitudinal <u>.</u>	0 , .001 i	n./in.	se ,00		Blui	ing Pin	Rollout			
Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.											
Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2			ļ							
	#3										
	##66	4.0	3.0	3.0	3.0	4.0	3.0	3.0			
Hole #2 Surface Finish, AA											
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3										
	#\$ 7	3.0	4.0	3.0	4.0	4.0	70 510	2.0			

MAN	IUFACTU	PORT: T	TAPERED HOLES						
Test Series 4 Specimen No. 5772		ity Vari	able _						
Hole Manufacturing C	onditio	ons and	Procedu	res:					
Spindle, rpm Cutting Fluid:				eed: epth: (I	nd. Reac	lina)			
Surface Finish, AA 34-36 Protrusion, in. Perpendicularity, .001 in./in.									
Perpendicularity, .001 in./in.  Longitudinal Transverse.005  Flush Gage Reading, in									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2									
#3 # <b># 6</b> # <b>\$</b> 7	3.0	3.0 3.0	40	5.0	4.0	2.0	5.0		
Surface Finish, AA			tole #2		Bluir	ng Pin R	ollout		
Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse, 003  Flush Gage Reading, in002  Capacitance Gage Reading 293  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2									
#3 # <b>X</b> 6 # <b>X</b> 7	4.0 1.0	3.0 1.0	3.0 1.0	4.0	4.0 3.6	5.0	3.0		

	MAI	NUFACTU	ORT: T	APERED H	IOLES				
Test Se Specime	eries 4 en No. 5816		ity Vari	able _					
Hole Ma	nufacturing (	Condition	ons and	Procedu	res:				
	dle, rpm ing Fluid:				eed: epth: (I	nd. Reac	ling) _		
Hole #1  Surface Finish, AA 22-14 Bluing Pin Rollout  Protrusion, in. O  Perpendicularity, .001 in./in. Longitudinal O Transverse 10035									
Capa	Flush Gage Reading, in. 1002 Capacitance Gage Reading 290 Exit Burr Height, in.								
	Air Gage Readings (.0001 in.) Angular Position								
	Axial Position 0° 45° 90° 180° 225° 270° 315°								
	Bottom #1 #2								
	#3 #0(6 #88 2	4.0	3.0	4.0	4.0	4.0	7.0	2.0 1.0	
	'92 / 1			1710	1810			7.0	
Protr Perpe L Flush Capac	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse ,0005  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.								
,	Air Gage Readings (.0001 in.) Angular Position								
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
ı	Bottom #1 #2								
	#3	4.0	3.0	3.0	4.0	6.0	4.0	40	
ŀ	#5 7	3.0	1.0	0	0	4.0	3.0	2.0	

МА	NUFACTU	RING REP	ORT: T	APERED H	HOLES				
Test Scries 5 Quality Variable Specimen No. 313613									
Hole Manufacturing	Hole Manufacturing Conditions and Procedures:								
Spindle, rpm Feed: Cutting Fluid: Depth: (Ind. Reading)									
Hole #1 Surface Finish, AA 28.32 Bluing Pin Rollout									
	001 7	ransver							
	Longitudinal 1001 Transverse 1001  Flush Gage Reading, in. 1002  Capacitance Gage Reading 253  Exit Burr Height in								
	_	ir Gage			1 in.)				
Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 #2	<u> </u>	5.0	13.0	10.0	11,0	4.0	13.0		
#3 #4 #5	12.0	3.0	7.0	6.0	11.0	5.0 8.c	9.0 3.0 4.0		
Surface Finish, A	Δ		tole #2		Blui	ng Pin I			
Protrusion, in. Perpendicularity,	.001 i	<i>O</i> n./in.		_	<u> </u>				
Longitudinal 66/ Transverse 0 Flush Gage Reading, in. 603 Capacitance Gage Reading 288 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2	12.0	11.0	1.0	10.0	11.0		6.0		
#3 10.0 11.0 1.0 10.0 11.0 12.0 3.0 #4 6.0 9.0 4.0 10.0 2.0 9.0 5.0									

МА	NUFACTU	RING REF	ORT: T	APERED H	OLES				
Test Series 5 Quality Variable Specimen No. 5818									
Hole Manufacturing Conditions and Procedures:									
Spindle, rpm Feed: Cutting Fluid: Depth: (Ind. Reading)									
Hole #1 Surface Finish, AA									
Protrusion, in. Perpendicularity Longitudinal	.001	n./in. ransver	se , 000	— 75					
Flush Gage Readir Capacitance Gage Exit Burr Height,	ng, in. Reading	0	4						
tare burn herghe,	_	ir Gage			1 in.)				
Axial Position	0°	Angu 45°	lar Posi 90°	180°	225°	270°	315°		
Bottom #1 #2	14.0	15.0	15.0	15.0	15.0	15.0	3.0		
#3 #4	9.0	5.0	4.0	7.0	2.0	70	10		
#5	7.0	1.4.0	1010 #2	7.0	15.0	4.0	1.0		
Protrusion, in. Perpendicularity, Longitudinal	Perpendicularity, .001 in./in. Longitudinal ,001 Transverse O Flush Gage Reading, in.								
Exit Burr Height,		: - Cago	Panding	 ( 0001	in )				
[ <del></del>	Air Gage Readings (.0001 in.) Angular Position								
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2	9.0	15.0	15.0	15.0	15.0	15.0	15.0		
#3 #4 #5	48	12.0	10.0	11.0	2.0	7.0	8.0		

MANUFACTURING REPORT: TAPERED HOLES									
Test Series Quality Variable Specimen No. 4E3T									
Hole Ma	Hole Manufacturing Conditions and Procedures:								
	Spindle, rpm Feed: Cutting Fluid: Depth: (Ind. Reading)								
	ace Finish,			Hole #1		Blu	ing Pin	Rollout	
Perp	rusion, in. endicularity ongitudinal	, .001		se ,00	 z				
Flus Capa	Longitudinal 1001 Transverse 1002  Flush Gage Reading, in. Capacitance Gage Reading 367								
Exit	Exit Burr Height, in.  Air Gage Readings (.0001 in.)								
		-		lar Pos					
	Axial Position 0° 45° 90° 180° 225° 270° 315°								
	Bottom #1	15.0	140	14.0	14.0	14.0	140	14.0	
	#2	11.0	13.0	13.0	12.0	5.0	10.0	12.0	
	#3	2.0	70	2.0	20	4.0	6.0	15:0	
	#5	-2.0	40	7.0	4.0	1.0	-10	20	
				19.0	1 7/4	17.9	11.0		
Proti Perpo l Flush Capac	Hole #2  Surface Finish, AA								
	Air Gage Readings (.0001 in.) Angular Position								
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1	15.0	14.0	14.0	14.0	140	14.0	14.0	
#2									
#3 6.0 5.0 2.0 4.0 9.0 6.0 5.0 #4 3.0 2.0 -3.0 3.0 4.0 5.0 0									
	#5	2.0	3.0	0	0	0	2.0	2.0	

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries <u>6</u> n No. <u>304</u>		ity Vari	able _						
Hole Manufacturing Conditions and Procedures:										
	dle, rpm ing Fluid:		<del></del>		eed: epth: (	Ind. Rea	ding) _			
Hole #1 Surface Finish, AA 60-65 Bluing Pin Rollout Protrusion, in. 0										
Perpendicularity, .001 in./in. Longitudinal 10001 Transverse O Flush Gage Reading, in001 Capacitance Gage Reading 284										
	Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position									
	Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1	14.0	-	_	_	12 0	-			
	#2	11.0	90	2.0	4.0	9.0	10.0	2.0		
	#4	7.0	8,0	0	5.0	20	8.0	4.0		
	#5	4.0	2.0	3.0	9.0	4.0	6.0	3.0		
Protr Perpe L Flush Capac	Hole #2  Surface Finish, AA 20-22 Bluing Pin Rollout  Protrusion, in. O  Perpendicularity, .001 in./in.  Longitudinal, 00/ Transverse, 002  Flush Gage Reading, in002  Capacitance Gage Reading 321  Exit Burr Height, in.									
Г	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
[	Bottom #1			_			~			
	#2	14.0	8.0	15.0	11.0	15.0	10.0	14.0		
-	#3	10.0	60	5.0	50	13,0	4.0	9.0		
}	#4	3.0	2.0	-4.0	4.0	8.0	6.0	2.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series Quality Variable Specimen No. 4627										
Hole Manufacturing Conditions and Procedures:										
Spindle, rpm Feed: Cutting Fluid: Depth: (Ind. Reading)										
Hole #1										
Prot	Surface Finish, AA 50-55 Bluing Pin Rollout Protrusion, in.									
L	Perpendicularity, .001 in./in. Longitudinal .00/ Transverse .00/									
Capa	Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.									
	Air Gage Readings (.0001 in.)									
	Avial	T	Angu	lar Posi	tion		T			
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1									
	#2	15.0	8.0	10.0	100	10.0	14.0	11.0		
	#3	14.0	13.0	9.0	11.0	9.0	15.0	10.0		
	#4	14.0	13.0	9.0	13.0	11.0	130	7.0		
	#3	11.0	14.0	17.0	1/2/9	1770	1310	77.0		
	ace Finish, A	A —		lole #2		Blui	ng Pin I	Rollout		
1	endicularity, Longitudinal h Gage Readin	0		se 🕡	2[			·		
Capac	citance Gage Burr Height,	Reading	24.	<u>د</u>			•	0		
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Pottom #1				-	_				
	Bottom #1 #2	14.0	9.0	11.0	5.0	14.0	9.0	12.0		
	#3 12.0 11.0 6.0 6.0 13.0 11.0 90									
	#4	10.0	11.0	3.0	8.0	10.0	11.0	7.0		
	#5	9.0	11.0	5.0	9.0	8.0	7.0	7.0		

	MANUFACTURING REPORT: TAPERED HOLES								
Specime	Test Series 6 Quality Variable Specimen No. 3053  Hole Manufacturing Conditions and Procedures:								
	Spindle, rpm Feed: Cutting Fluid: Depth: (Ind. Reading)								
Prot Perp Li Flus Capa	Hole #1  Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse O  Flush Gage Reading, in.  Capacitance Gage Reading								
	Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position								
	Axial Position 0° 45° 90° 180° 225° 270° 315°								
	Bottom #1 — — — — — — — — — — — — — — — — — —								
Protr Perpe L Flush Capac	Surface Finish, AA SS.60 Bluing Pin Rollout Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal occs Transverse .001  Flush Gage Reading, in. Capacitance Gage Reading 224  Exit Burr Height, in.								
	Air Gage Readings (.0001 in.) Angular Position								
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1								

INSPECTION SHEETS FOR TEST SERIES 7 - PERPENDICULARITY

Test Series 7	Quali	ty Vari	able PE						•
Produce Good Hole Us Tools: #2 Centerdri Spindle, rpm Cutting Fluid: STA	11; 19/0	64 in. 1	oilot dri	111; Group Feed:	) N. J. Omark HANK 1: (Ind.	CDrill R	leamer (T	LD2040AR1	-5)
Procedure: SET HULE USING	OMA 3 25 DDAR 1/FAD LOCATI CENTI MINIAL No. 52 A .001 in .001/INC	ANGLANGERING BIT  Agage Transve	RILL - R  VENIT  E 3°  OD SITIL  MICKO  FERENC  H  3 2	FAMER Feed: Depth IN TRA NOT THE SCOPE THEN Hole #1	I: (Ind. NSVERS BLE IN SPIN BEAM	E DIRECT RAW	L. 18 TION; 5 SVERSE RILL SRE	CRIBE DIRECTIVE FAM HOLE TH GR. 2 RE	-
Axial Position  Bottom #1 #2 #3 #4 #5	0°		90°	(.0001 i	180°	225°	270°	315° 0 0 0	
Surface Finish, AA Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Reading Capacitance Gage F	./5 .001 in .5:/wex ), in.	7 ./gage Transvei	g length	le #2	426 72 177 72		Pin Roll 30%	out	<b>↓</b>
Axial Position	0°	Gage F Angula	Readings ar Posit 90°	(.0001 in ion 135°	180°	225°	270°	315°	]
	0 0 0	0000	00000	0000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 000	0 0 0 0	0 2 0 0	

Test Series 7	_ Quality Vari	able P						•
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325  Cutting Fluid: STOODARD SOLVENT  Depth: (Ind. Reading) 1.757								
Spindle, rpm Cutting Fluid: 57 Procedure: 557 HULE USING	OMARK L	PRILL - R	FAMER Feed Depti	HAND 1: (Ind. INSTERS BLE IN IN SPIN	E DIRECT RAW.	1.18 TION, S SVERSE BILL SR	CRIBE DIRECTION FAM HOLE	-
Results: Specimen Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Readin Capacitance Gage	A ./43 .001 in./gage .002/www.Transve g,/in.	length erse .05		- - - 366 5		Pin Rol	lout <b>↓</b>	+
Axial Position  Bottom #1 #2 #3 #4 #5	Air GageAngul  0°	Readings lar_Posit	135°	180°	225°	270°	315°	
Surface Finish, AA Protrusion, in. Perpendicularity, Longitudinal, A Flush Gage Reading Capacitance Gage F	.001 in./gage .001 in./gage p.4/wc# Transver g., in	length	1e #2	351 40 371		Pin Roll 70%	out <b>∳</b>	<b>.</b>
Axial Position	Air Gage F Angul O° 45°	Readings ar Posit 90°	(.0001 in ion 135°	180°	225°	270°	315°	
Bottom.#1#2#3#4#5	0 00	00	00.3	20.00	000	000	) o (c)	

Test Series 7	Qual	ity Vari	able /	ERPENIL	CULARI	TY DE	VIATION	<u>v - グ゛</u>		
Produce Good Hole Using Following Conditions: M.N. INTERFERENCE										
Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)										
Spindle, rpm 325 Feed: HAND -0.5 IPM Cutting Fluid: STONDARD SOLVENT Depth: (Ind. Reading) 1.75 7										
Cutting Fluid: STONDARD SOLVENT Depth: (Ind. Reading) 1.75 7										
Modify Good Holes										
Tool: GROUP			RILL - P	CAMER			4			
Spindle, rpmCutting Fluid: <5	325	en Soi	14.54	Feed Dept	: <i>HAA'D</i> h: (Ind.	- 0.5" Reading	1 10	.3		
					MSVERS					
HULE	LOCA	TICK 1	POSITI	CON IN	BLE IN	I BAN	SYEKSE	DIKEL TICE!		
HULE LOCATION POSITION TABLE IN TRANSVERSE DIRECTION USING CENTERING MICROSCOPE IN SPINULE - DRILL SREAM HOLE FOR NOMINAL INTERFERENCE THEN REAM OCO DEEVER WITH GR. 2 REMAIN										
EOK_A	COMINIAL	LIVIEN	FERENC	E IHEN	KEAM	CCC	EPEK WII	MLR. C NEME		
Results: Specime		AAT	1	Hole #1						
Surface Finish,	AA	1172			-	Bluing	Pin Roll	lout 4		
Protrusion, in/4/ Perpendicularity, .001 in./gage length										
Longitudinal .003/MCH Transverse .055/INCH										
Flush Gage Reading, in026 70°.										
capacitance dage	Capacitance Gage Reading: 410 375 490									
	Ā			(.0001 i	<u>n.)</u>					
Axial	= -	Angu	lar_Posi	t Joh	1		1	1		
Position	0°	45°	90°	135°	180°	225°	270°	315°		
Danna #1	-					·	-	+		
Bottom #1 #2	00	0		9		0	0	0		
#3	0	0	. 0.	a	a	- Q		10		
#4_	0	<u> </u>		0			0			
1		1 0	<i>U</i>							
			Но	le #2						
Surface Finish,		<del></del>	3.5		•	Bluing	Pin Rolle	out		
Protrusion, in. Perpendicularity		1.3 n./gage	length		•					
Longitudinal	1003/MCH	Transve	rse .os	1/10:00				1		
Flush Gage Readi	ng, ìn.		30		788			'		
Capacitance Gage	Reading	:	100		388 6 9 413	• •	N.			
					1					
	<u>A</u>	ir Gage I	Readings	(.0001 i	<u>n.)</u>					
Axial	i* -	Angul	ar Posit	Ion			1			
Position	0°	- 45°	90°	135°	180°	225°	270°	315°		
	+		<del> </del>							
Bottom #1#2	0	0			(1)	<u> </u>	0	0		
//3	10	0	2-	- S	6	o	٥	0		
#4	To	0	0	0	<u></u>	0	<u> </u>			
1		0	O.	0	Ø	٥	O I	0		

Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3°										
M.A. TAITEBERACE										
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)										
Spindle, rp		325	04 111.	priot ur	Feed				LUZU4UAK I -	) <i> </i>
Spindle, rpm 325 Feed: HAND -0.5 IPM Cutting Fluid: STRADARD SOLVENT Depth: (Ind. Reading) 7.757										
Modify Good Holes Using Following Conditions:										
Tool: GROVE 2 OMARK DRILL-REAMER										
Spindle, rp	m	325	-		Feed	HAND	-0.57	PM		
Cutting Flu	id: 51	DAAA	o Soc	KENI		n: (Ind.	Reading)	1.18	30 :	•.
Procedure:	SET	HEAD	ANGL	E 30	IN TRA	NSVERS	E DIRES	CTION, S	CRIBE	•
									DIRECTION	
	USING	CEN	FRING	MICRO	SCOPE	W SPIN	DIE - D	RILL & RI	EAM HOLE	
	FOR NO	MINAL	INIER	FEKENC	E THEN	KEAM	060" DE	EPER WII	TH GR. Z REA	MEK
Results:			1350	<u>H</u>	lole #1					
	Finish, A		2			_	Bluing	Pin Rol	lout	
Protrusi	on, in	.14	C			-			Ψ ,	r
	cularity,									
Long Eluch Ca	ge Readin	DOLLING			2/1NCH	•				
	nce Gage		02	325		3554	1 70	٥٠,٠		
Capacita	nee dage		•	323	<del></del>	419		· .		
		A	ir Gage	Readings	(.0001 i	n.)				
		,	Angul	ar_Posit	on			<del>-,</del>		7
	kial	00	450	000	1	1000	0050	0700	23.50	1
Pos	sition	0°	45°	90°	135°	180°	225°	270°	315°	1
i Res	ttom #1	0							1	Ī
1	#2	0	0				<u> </u>	5	<del></del>	-
	#3	0	0	ن	0	-2 -		-0	1 3	1
	#4	0	0	0	• )	ن ا				]
L	#5	10		0	0	<u> </u>				]
C	-t-t-b A			Но	le #2		Rluina	Pin Roll	out	
Protrusio	Finish, A	.14					bruring	I III NOI I		
	ularity,			lenath					* 1	
Longi	tudinal	milute	Transve	rse^≤	4/1004					
Flush Gag	e Reading	q. 1n.	.02		1/11-50		(A)			
	ce Gage			408		405 38	36 30	7,		
						1.5			1	
					/ 0001 !	- \				
		<u>A1</u>	r Gage F	Readings	(.0001 i	<u>1.)</u>				
1 40	ial	,	Angui	ar Posit	ion		T	1	7	
	ition	0°	45°	90°	135°	180°	225°	270°	315°	
103				ļ						
Bot	tom #1	_0_		0	0	2			<u> </u>	
	#2	0	Q_	0			ت ت	2	J	
	#3	0	0	- 0	Q	J.	J		0 -	
	#4	2	0	0	0		ن	0	0	
	#5	0	0	0	5	E'	(2)	ن	10	

Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3°										
Produce Good Hole Using Following Conditions:  M.N. INTERFERENCE  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325 Feed: HAND -0.5 IPM  Cutting Fluid: STONDARD SOLVENT Depth: (Ind. Reading) 1.755										
Cutting Fluid: STODDARD SOLVENT De Procedure: SET HEAD ANGLE 3° IN T  HULE LOCATION, POSITION T  USING CENTERING MICROSCOPE  FOR NOMINAL INTERFERENCE THE	ER  eed: HAND - O. STPAT  epth: (Ind. Reading) 1,180  RANSWERSE DIRECTION; SCRIRE  TABLE IN TRANSWERSE DIRECTION  E IN SPINNIE - DRILL SREAM HOLE  EN REAM OLO "DEEPER WITH GR. 2 REAMER									
Results: Specimen No. 5448 Hole #1 Surface Finish, AA	Bluing Pin Rollout									
Protrusion, in	70% = 37/436									
	Air Gage Readings (.0001 in.)									
Axial Position 0° 45° 90° 135°										
#2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0										
Surface Finish, AA Protrusion, in.  1001	Bluing Pin Rollout									
Perpendicularity, .001 in./gage length  Longitudinal. <u>co2/wcy</u> Transverse .052/wc  Flush Gage Reading, in329  Capacitance Gage Reading: 374	- 367 531 70%									
Air Gage Readings (.0001 Angular Position	in.)									
Axial Position 0° 45° 90° 135°	180° 225° 270° 315°									
Bottom #1 0 0 0 0	0 0 0 0									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$										
14 0 0 0 0	0 0 0									

Test S	Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3°									
Tools: Spindl	Produce Good Hole Using Following Conditions:  M.N. INTERFERENCE  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325  Cutting Fluid: STONDARD SOLVENT  Depth: (Ind. Reading) 1,755									
Tool: Spindle Cuttin	Modify Good Holes Using Following Conditions:  Tool: GROUP 2 OMARK DRILL-REAMER  Spindle, rpm 325 Feed: HAND - O. 5 TPM  Cutting Fluid: STODDARD SOLVENT Depth: (Ind. Reading) 1,180  Procedure: SET HEAD ANGLE 3° IN TRANSVERSE DIRECTION; SCRIRE  HULE LOCATION POSITION TABLE IN TRANSVERSE DIRECTION  USING CENTERING MICROSCOPE IN SPINULE - DRILL SREAM HOLE  FOR NOMINAL INTERFERENCE THEN REAM .000" DEEPER WITH GR. 2 REAMER									
Sur Prof Per Flus	s: Specimentace Finish, A trusion, in pendicularity, Longitudinal, sh Gage Readin acitance Gage	.001 i .001/mcA	37 n./gage Transve	length rse <u>os</u>	,	- - - 3.13 40		Pin Roll	lout	
		<u>A</u>		Readings ar_Posit	(.0001 i	<u>n.)</u>				
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	#2 #3 #4 #5	0 0 +0.5	4 C 2 0 0	+0.5 -0 -0 -0	0 0	0000	0 0 0	0 0 -0.5 C	0 0 0	
Prot Perp	Surface Finish, AA Protrusion, in.									
Flus	Longitudinal <u>003 wes</u> Transverse <u>052/wes</u> Flush Gage Reading, in. <u>028</u> Capacitance Gage Reading: 418									
Air Gage Readings (.0001 in.) Angular Position										
ı	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	_Bottom_#1 #2 #3 #4	0000	0000	0000	2000	0000	0.00	0 <b>0 0</b> 0	3 	
	#5	0	0	()		. ')	( )		C	

lest series / Quality variable / ERPENDICULARITY DEVIATION = )									
Produce Good Hole Using Following Conditions: M.N. INTERFERENCE									
Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)									
Spindle, rpm 325 Feed: HANO -0.5 IPM									
Cutting Fluid: STONDARD SOLVENT Depth: (Ind. Reading) 1.755									
Modify Good Holes Using Following Conditions:  Tool: GROUP 2 OMARK DRILL-REAMER  Spindle, rpm 325 Feed: HAND-O.5-TPM  Cutting Fluid: STODDARD SOLVENT Depth: (Ind. Reading) 1./50  Procedure: SET HEAV ANGLE 3° IN TRANSVELSE DIRECTION, SCRIRE  HULE LOCATION POSITION THREE IN TRANSVERSE DIRECTION  USING CENTERING MICROSCOPE IN SPINULE - DRILL BREAM HOLE  EOR NOMINAL INTERFERENCE THEN REAM									
Longitudinal O Transverse .053/WCH									
Flush Gage Reading, in029									
Capacitance Gage Reading: 4/9 -139 4-2 70%									
Air Gage Readings (.0001 in.)									
Angular Position , , , , , , , , , , , , , , , , , , ,									
Axial 00 459 009 1250 2250 2350 2350									
Position 0° 45° 90° 135° 180° 225° 270° 315°									
Bottom #1 -0.5 30.5 -0.5 -0.5 -0.5 -0.5 -0.5									
The state of the s									
The second secon									
#5 0 0 0 0 0 0									
The state of the s									
Hole #2									
Surface Finish, AA 103 Bluing Pin Rollout									
Protrusion, in152									
Perpendicularity, .001 in./gage length									
Longitudinal .003/19CL Transverse .055/10CG									
Flush Gage Reading, in031 705.									
Capacitance Gage Reading: 427									
Air Gage Readings (.0001 in.)									
Angular Position									
Axial 00 458 009 1259 2709 2159									
Position 0° 45° 90° 135° 180° 225° 270° 315°									
Bottom #1 -0.5 -0.5 0 0 0 -0.5 -3.5									
13 0 0 0 0 0 0 0									
#5 -0.5 -0.5 -0.5 -0.5 -0.5 -0.5									

Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3"
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325 Feed: HAND -0.5 IPM  Cutting Fluid: STANDARD SOLVENT Depth: (Ind. Reading) 1.755
Modify Good Holes Using Following Conditions:  Tool: GROVP 2 OMARK DRILL-REAMER  Spindle, rpm 325 Feed: HAND-O.5-IPM;  Cutting Fluid: STODDARD SOLKENT Depth: (Ind. Reading) 1./30  Procedure: SET HEAD ANGLE 3° IN TRANSVERSE DIRECTION, SCRIRE  HULE LOCATION POSITION TABLE IN TRANSVERSE DIRECTION  USING CENTERING MICROSCOPE IN SPINULE - DRILL FREAM HOLE  FOR NOMINAL INTERFERENCE THEN REAM CCO" DEEPER WITH GR. 2 REME
Results: Specimen No. 5 C 2 G Hole #1  Surface Finish, AA 30  Protrusion, in
Air Gage Readings (.0001 in.)  Angular Position  Axial Position  0° 45° 90° 135° 180° 225° 270° 315°  Bottom #1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Surface Finish, AA  Protrusion, in.  o/55  Perpendicularity, .001 in./gage length  Longitudinal 30/200 Transverse .05//.000  Flush Gage Reading, in028  Capacitance Gage Reading: 417 600
Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°  Bottom #1 -/ -/ -/ -/ -/ -/
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

Test S	Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3°									
Tools: Spindle	Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325 Feed: HAND -0.5 IPM  Cutting Fluid: STONDARD SOLVENT Depth: (Ind. Reading) 1,755									
Modify Good Holes Using Following Conditions:  Tool: GROUP 2 OMARK DRILL-REAMER  Spindle, rpm 325 Feed: HAND-0.5-IPM  Cutting Fluid: STODARD SOLVENT Depth: (Ind. Reading) 1.180  Procedure: SET HEAD ANGLE 3° IN TRANSVERSE DIRECTION; SCRIRE  HULE LOCATION, POSITION TARKE IN TRANSVERSE DIRECTION  USING CENTERING MICROSCOPE IN SPINULE - DRILL AREAM HOLE  EOR NOMINAL INTERFERENCE THEN REAM .000"DEFFER WITH GR. 2 REAMER										
Surf Prot Perp Flus	Results: Specimen No. 5E4CE Hole #1  Surface Finish, AA / Bluing Pin Rollout  Protrusion, in/56  Perpendicularity, .001 in./gage length  Longitudinal .oo//wcm Transverse .o5o/wcm  Flush Gage Reading, in028  Capacitance Gage Reading: 479 348 70%									
	Axial Position	0°		Readings lar_Pos.i	(.0001 i	180°	225°	270°	315°	
	#3 #4 #5	-0.5			-0.5 -0.5	-0.5 -0.5 0 0	-0.5 -0.5 0	-0.5 -0.5 0	-0.5 -0.5 -0.5	
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./gage length  Longitudinal .pol/wcr Transverse .or 3/wc  Flush Gage Reading, in028 Capacitance Gage Reading: 999 362 526										
Air Gage Readings (.0001 in.) Angular Position										
Ī	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	Bottom #1 #2	<u>-0.5</u>	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5 0	
	#3 #4	0	0	00.	0		0	0	0	
1	#5	0	0		0	0	0		0	

Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3°
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325  Cutting Fluid: STONNARD SOLVENT  Depth: (Ind. Reading) / 755
Modify Good Holes Using Following Conditions:  Tool: GROUP 2 OMARK DRILL-REAMER  Spindle, rpm 325 Feed: HAND-0.5 [PM]  Cutting Fluid: STODARD SOLVENT Depth: (Ind. Reading) 1.180  Procedure: SET HEAD ANGLE 3° IN TRANSVERSE DIRECTION, SCRIRE  HULE LOCATION POSITION TABLE IN TRANSVERSE DIRECTION  LISTAIG CENTERING MICROSCOPE IN SPINULE - DRILL &REAM INCLE  FOR NOMINAL INTERFERENCE THEN REAM OLD DEEPER WITH GR. 2 REME
Results: Specimen No. 66/6 Hole #1  Surface Finish, AA 3!  Protrusion, in. 150  Perpendicularity, .001 in./gage length  Longitudinal 0 Transverse .055/1964  Flush Gage Reading, in027  Capacitance Gage Reading: 440 3-15 424
Air Gage Readings (.0001 in.)  Angular Position  Axial Position  0° 45° 90° 135° 180° 225° 270° 315°  Bottom #1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./gage length  Longitudinal accorded Transverse .035 / 70%  Flush Gage Reading, in.  Capacitance Gage Reading: -52 379 520 70%
Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°
Bottom #1 0 0 13 100 223 270 370 133 100 223 270 370 133 100 223 270 370 133 100 223 270 370 133 100 223 270 370 133 100 223 270 370 133 100 223 270 370 133 100 223 270 370 133 100 223 270 133 100 270 1

Test Se	ries <u>7</u>	Qualit	y Varia	able <u></u>	ERPEN	DICULA	RITY DE	VIATION	1 - 3°
Tools: Spindle	Good Hole Us #2 Centerdri , rpm Fluid: 570	11; 19/6 <b>3</b> 2.5	4 in. s	oilot dri	ll; Group Feed	ELAND	k Drill R -0,51	leamer (T	
Tool: Spindle	Fluid: ST. re: SET  HOLE  CENTER	E OM 323 DDARH HEAD LOCATIS	ARK SOL ANG I IN, P	DRILL VENT E 3' 1 OSITION COPE 11	REAM Fued: Depth  N THAN TABLE N SE'INI	HANL SVERSE LA TRAM DLE - D	DIRECT SVERSE RILL & A	1.81 DIRECTI PEAM H	KIBE TON USING
Surfa Protr Perpa L Flush	Specimen ace Finish, A rusion, in. endicularity, ongitudinal, Gage Reading itance Gage I	.25 .001 in. (C2/INCH)	3 /gage ransve	length rse <u>.cs</u> =		- - - - - - - - -		Pin Rol	lout +
		Air	Gage	Readings	(.0001 i	<u>n.)</u>			•
	Axial Position	0°	Angu.l 45°	ar_Posit	on 135°	180°	225°	270°	315°
214	Bottom #1 	0000	000	0 0 0	0	0 0 0	22	0.00	- C - C - C
Protr Perpe L Flush	ce Finish, AA uslon, in. ndicularity, ongitudinal <u>.</u> Gage Reading itance Gage R	. 2 Z .001 in. ocs T	/gage	length	e #2 2/14/C#	240 30	6	Pin Roll	out .
-		<u>Air</u>	Gage R Angula	leadings ar Positi	(.0001 ir	n.)			<u> </u>
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
11.4	Bottom #1#2#3#4	2	7		<u></u>	-,	7 3	; ; ;	0
1	#5	0	0	0	+ 0.2	<u>+ 0.5</u>	0	2/1/-	70.5

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Test Series	Qual	ity Varia	ible <u>F</u>	ERPEN	DICULA	LITY DE	VIATION	/ - 3°
Produce Good Holo Tools: #2 Cente Spindle, rpm Cutting Fluid:	rdrill; 19. <b>3</b> 2.5	/64 in. p	ilot dri	11; Group Feed:		k Drill R -0.51	eamer (TI	
Modify Good Hole: Tool: VALLER: Spindle, rpm Cutting Fluid: Procedure: 5  HOL CELL Results: Special Surface Finish Protrusion, in Perpendiculari	STODAR STODAR ET HEAD ELOCAT TERING IMEN NO. 5 IN, AA In, AA Inty, .001 in Inal octions	lowing C MARK SIN SOL DANGLE CAN PO MICRUS - OC. 6 3 CT 3 OC. 6 -	Ondition  DRILL  VENT  E 3'  SITIEN  COFE 111  O'', THE	REAM Feed: Depth N TRAN TABLE N SI'NN N Co Sin	HANL I (Ind. SVERSE IN TRAM DLE - D	ISVERSE RILL & K LINDERS	PINECTI PEAM IN SIZE DAY	RIBE BN USING BLE LL-RENMER
Axial Position  Rottom # ###################################	0° 1 0 2 0 3 0		Readings ar_Posit 90°	(.0001 in in in in in in in in in in in in in	180°  0 .2 .2	225° 0 	270°	315°
Surface Finish Protrusion, in Perpendiculari Longitudin Flush Gage Rea Capacitance Ga	ty, .001 is al. 003/10/ ding, in.	.46 n./gage l √Transver .0∴	2 ength se ,,,5	6 #2	3 <i>70</i> 3 <b>66</b>	Bluing 70%	Pin Rollo	put ↓
Axial Position		r Gage R Angula 45°	eadings ar Posit 90°	(.0001 ir ion 135°	180°	225°	270°	315°
		0 0	0		ں 	<u>0</u>	د ا ا ا	<u>c</u> <u>s</u> <u>s</u>

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1/1-17:00

Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3°								
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-Spindle, rpm 325  Cutting Fluid: STODDARD SOLVENT Depth: (Ind. Reading) 1.7/5								
Modify Good Holes Using Following Conditions:  Tool: VANERSIZE OMARK DRILL REAMER  Spindle, rpm 325 Feed: HAND -0,5 IPM  Cutting Fluid: STODARD SOLVENT Depth: (Ind. Reading) 1,810  Procedure: SET HEAD ANGLE 3'IN TRANSVERSE DIRECTION, SCRIBE  HOLE LOCATION, POSITION TABLE IN TRANSVERSE DIRECTION USING  CENTERING MICRUSCUPE IN SPINDLE - DRILL & REAM HOLE								
SHALLOW BY . OGO" THEN CO'SINK WITH UNDERSIZE DRILL-REAME								
Results: Specimen No. 506C7 Hole #1  Surface Finish, AA 28  Protrusion, in242  Perpendicularity, .001 in./gage length								
Longitudinal 002 Transverse .053  Flush Gage Reading, in. 1027  Capacitance Gage Reading: 400 386								
Air Gage Readings (.0001 in.)								
Axial Angular Position								
Position 0° 45° 90° 135° 180° 225° 270° 315°								
Bottom #1 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0								
Hole #2								
Surface Finish, AA 32 Bluing Pin Rollout								
Protrusion, in. 248 Perpendicularity, .001 in./gage length  Longitudinal 001 Transverse 054  Flush Gage Reading, in029 Capacitance Gage Reading: 410								
Air Gage Readings (.0001 in.) Angular Position								
Axial Position 0° 45° 90° 135° 180° 225° 270° 315°								
Bottom #1 0 0 0 0 0 0								
#2 0 0 0 0 0 0								
14 C O O O O O O								
#5								

9/1/76 852

Test Series 7	Quality Vari	able <u>E</u>	ERPEN	DICULAN	LITY DE	VIATION	· - 3°	
Produce Good Hole Us Tools: #2 Centerdri Spindle, rpm Cutting Fluid: Sta	11; 19/64 in. 3 2.5	pilot dri	11; Group Feed:	o 1, Omarl	-0.51	camer (TL		
Results: Specimen Surface Finish, AA Protrusion, in. Perpendicularity,	DODARN SON MEAD ANG MEAD ANG MING MICKUS W MY OCH No. SAGCT 239	DRILL  VENT  AS I TION  COPE IN  O'' INIS  Length	REAM Feed: Depth N TXIN TABLE N SVINI N Co'SIN	HANUEL (Ind.	DIRECT SVERSE RILL & R UNDERS	MAC THE	RIBE AN USING DEE LL-REAREN	
Longitudinal. Flush Gage Reading Capacitance Gage R	, Ineading:	2.8 36.5 Readings	(.00v1 i	362	70	00%		
Axial Position  Bottom #1  #2  #3  #4	0° 45° 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	90°	135°	180°	225°  - C + C.S.	270° c 1- 4.5	315° + 0.5	
Surface Finish, AA 30  Protrusion, In. 226  Perpendicularity, .001 in./gage length  Longitudinal .com Transverse .com 412  Capacitance Gage Reading: 408 405								
Air Gage Readings (.0001 in.)  Angular Position								
Axial Position	0° 45°	90°	135°	180°	225°	270°	315°	
Bottom #1 #2 #3 #4 #5	0 0 0 0 0 0			0	0 C 0 0	0 0 0	0 0	

9/1/2/

Test Series 7 Quality Variable PERPENI	DICULAR	ITY DE	VIATION	<u> </u>
MAX	(. INTE	KFEREI	VCE	
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group				102010001-6
	ELAND			LUZU4UAN I - 5
	n: (Ind.	Reading)	1.7	15
VINNE SUFFICIENT	•	3,	-4-4-4-4-4	· • · · · · · · · · · · · · · · · · · ·
Modify Good Holes Using Following Conditions:				
Tool: UNDERSIZE OMARK DRILL REAM	ER		<del>-</del>	
Spindle, rpm 325 Feed:	(Ind.	-0.5.	FPM_	<u></u>
Cutting Fluid: STODDARD SOLVENT Depth Procedure: SET HEAD ANGLE 3° IN TRANS		_		(d)
HULE LOCATION, POSITION TARKE				
CENTERING MICHUSCOPE IN STIND	ILE - D	RILL & R	EAM H	OLE
SHALLOW BY . OGO" THEN CO'SIN				
December Charleson No. A 514 Hole #1				
Results: Specimen No. 4E/B Hole #1 Surface Finish, AA 24		Rluina	Pin Roll	out
Protrusion, in238	•	biding	1 111 11011	<u> </u>
Perpendicularity, .001 in./gage length	•	,		
Longitudinal Transverse .052/2023	3°05	Willy to		
Flush Gage Reading, In. 1026		. •		
Capacitance Gage Reading: 330	360	7	5%	
Air Gage Readings (.0001 in	n.)			
Angular Position				
Axial				1
Position 0° 45° 90° 135°	180°	225°	270°	315°
				1
14 - Bottom #1 0 0 0 0		-2-		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0	+1	1 ±	+ 0
14 0 0 0 0	0	0	0	0
HS OPEN	1			
1 10				
Hole #2		Rluina	Pin Rollo	nut
Surface Finish, AA Protrusion, in.		bruring	1 111 107110	1 1
Perpendicularity, .001 in./gage length				4
Longitudinal O Transverse 577575				<b>)</b> 1
Flush Gage Reading in 028	400	7.	0%	]
Compainance Code Pendings 2 70	420	,,	10	
				1
Air Gage Readings (.0001 in	)			,
Angular Position				
Axial				
Position 0° 45° 90° 135°	180°	225°	270°	315°
			0	0
Bottom #1 0 0 0				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		0	0 3	<u>0</u>
#4 0 0 0 0	0	0	Ö	0
15 3445				

1/1/20

Test Series 7	Quality Vari	able <u></u>	ERPEN	DICULAR	ITY DE	VIATION	1 - 3°
0 1 0 1 1 1 1 1 1			MA	X. INTE	KFEREI	VCE	
Produce Good Hole Usi Tools: #2 Centerdril	ng following	condition		1 Omarl	neill p	oomor (T	LD2040AR1-5
Spindle, rpm		priot di					
Cutting Fluid: 570	DEARD SOLVE	-NT	Depti	: <i>Élavo</i> n: (Ind.	Reading)	1.7/	<u>'5</u>
Modify Good Holes Usi				- 12			
	325	DRILL	Feed:	EK HANI	-0.5	I PM	
Cutting Fluid: 570		VENT		1: (Ind.		1.51	<u> </u>
Procedure: SET	HEAD ANG	E 3º					
HOLE L	OCATION, P	OSITION	TABLE	IN TRAN	SVERSE	DIRECTI	ON USING
	NG MICHUS						
SHACE	W BY .U.	O INE	71.S.C. 3/A	K WIIA	UNDERS	IZE DKI	LL-NEAMER
Results: Specimen		H	ole #1				
Surface Finish, AA				_	Bluing	Pin Roll	out
Protrusion, in. Perpendicularity,	001 in /0300	length		-			4 1
Longitudinal			2 / 200 E				
Flush Gage Reading	, in.	3.3					
Capacitance Gage Ro		35		324	3	9,	1
				7.5			. ]
	Air Gage	Readines	( 0001 i	n )			
		ar_Posit		11.7			
Axial	1	1				]	
Position	0° 45°	90°	135°	180°	225°	270°	315°
Dana #1	4			_			+
Ay Bottom #1	0.5	-0_	<del>-</del>	<u> </u>	1-9-	<del></del>	1.9
#3	0 0	0	0	0	1 1	t.1	10
#4	0 0	_0		٥	0	0	0
#5		<u> </u>			L		
		Но	le #2				
Surface Finish, AA	2.8	110	IC WZ		Bluing	Pin Rollo	out
Protrusion, in.	.279						$\overline{T}$ 1
Perpendicularity, .	001 in./gage	length					* *
Longitudinal	Transvei	rse .cs	77 / CE				1
Flush Gage Reading,		3		366	700	•	1
Capacitance Gage Re	ading: 3	16		378	·		
	Air Gage F	Readings	(.0001 ir	<u>ı.)</u>			
*************************	Angul	ar Posit	ion	<sub>1</sub>	<del></del>		
Axial	0° 45°	90°	135°	180°	225°	270°	315°
Position	. 40						
Bottom #1	0 0	0		0	<u> </u>	0	<u>`</u>
#2	0		<u> </u>	0	<u> </u>		
#3	<u> </u>	0	<u> </u>	C			6
#4	0 0	<u> </u>					
J					1		
			65			3/7	

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Test Se	ries 7	Quali	ty Varia	able <u></u>	ERPEN	DICULAR	ITY DE	VIATION	1 - 3°	
Tools: Spindle	Good Hole Us #2 Centerdri , rpm Fluid: 57	11; 19/ 3.25	64 in. s	ilot dri	ill; Group Feed:		Drill R -0.51	eamer (T	LD2040AR1-5	
Modify Tool: Spindle Cutting Procedu  Results Surfi Prot Perpe	Good Holes Us  VAIDERS: 2  , rpm  Fluid: ST  HOLE  CENTER  SHALL  : Specimen ace Finish, A rusion, in. endicularity,	No. 50	lowing (  MARK  5  D Sol  ANGA  (ON, P)  MICHUS  - OCO  CGCT  22  A J  n./gage	DRILL  VENT  SITIEM  COPE  H  length	REAM Feed: Depth N TRAM TABLE N SPINI N SC SIM	HAND SVERSE IN TRAM DLE - D	DIRECT ISVERSE RILL & R UNDERS	1.8 DIRECT	CRIBE CON USING COLE UL-REAMER	
Flusi	Longitudinal, n Gage Readin citance Gage	g, in.	.02	.9	7	424 130	70 %	%	1	
	Air Gage Readings (.0001 in.)									
11	-	,		ar Posit			-{		<del></del> ,	
	Axia Position	0°	45°	90°	135°	180°	225°	270°	315°	
•	#2 #3 #4 #5	0000	0 000	0 0	0 0 0	0 0	0 0 0	0 0	0 0 0	
Protr Perpe L	ece Finish, A/cusion, in. endicularity, ongitudinal	.001 ir	Transvei	length	le #2		Bluing	Pin Roll	out 🔱	
	n Gage Reading citance Gage I		_5/			374 388	80%	, •	1	
		<u> A i</u>		Readings ar Posit	(.0001 ir	<u>ı.)</u>			,	
1	Axial									
	Position	0°	45°	90°	135°	180°	225°	270°	315°	
1	Bottom #1	_0_	U	O	0	C	0	0	0	
+	#2	0		_0		0			0	
†	#4	- 0	0	. Q	0	 ن	2	0	0	
1	#5							7.1		
		·	·					9/1/	E King	

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Test Series 7	Quali	ity Vari	able <u>f</u>	ERPEN	DICULA	UY D	VIATION	/ - 3°	
Produce Good Hole L Tools: #2 Centerdr Spindle, rpm Cutting Fluid: 57	111; 19/ 3 2.5	64 in.	pilot dr	ill; Group Feed	x. <i>Ivre</i> p 1, Omar h: <i>Elawo</i> h: (Ind.	k Drill F -0.51	Reamer (T	LD2040AR1-5	
Procedure: SET HOLE CENTE	2E 0, 3 2 2000AR HEAL LOCAT RING 1 0 W 33 10 No. 5 C AA 	MARK D SOLO LOW P MICKES LOW TAIN TAIN TAIN TAIN TAIN TAIN TAIN TAIN	PRILL VENT LE 3' LOSITION COPE 10 O'' THE H length rse .05	REAM Feed: Depth NOTABLE NO SI'NN A CC'SIN	HANI  I (Ind.  SYERSE  IN TRAM  OLE — 1)  OK WITH	ISVERSE RILL & K UNDER	Pin Roll	KIBE WAN USING WALE WAL-REAPIEN	
Air Gage Readings (.0001 in.)  Angular Position									
Axial Position  Bottom #1  #2  #3  #4  #5	0°	45°	90°	135°	180°	225°	270°	315°	
Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Readin Capacitance Gage	.001 ir 004 fuscr g, in.	Transver	length rse <u>.a5</u>		390 147	Bluing 80%	Pin Rolle	out y	
patanger to a constitution	<u>Ai</u>	r Gage F Angul	Readings ar Posit	(.0001 ir ion	<u>)</u>			;	
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
#1#1#3#4.	0 0	0 - 0 - 0	3 0 0	0 0 0	0	0 0 0 0	0 C C	0	
<u>  #5</u>	L				Section of the Contraction of th		9/1/	11.0	

Test Series 7 Quality Variable PERPENDICULARITY DEVIATION - 3°  Produce Cood Male Main Following Conditions: MAX. INTERFERENCE											
Tools: Spindle	#2 Centerdri #, rpm Fluid: 570	11; 19/ <b>3</b> 2.5	64 in. p	ilot dri	Il; Group Feed:		Drill Ro - <i>O.5 II</i> Reading)	eamer (TL	5	5)	
Tool: Spindle Cutting Procedu Results Surf Prot	Fluid: STA	DODAR HEAD KOCATI WW BY No. 40	D SOL ANGLE ON, PO MICRUSI CSB 32	DRILL  WENI  E 3° / OSITIAN  COPE // O' THE	REAM Feed: Depth N TRANS TARIE	HAND: (Ind.) SVERSE NO TRANS	-0.5 Reading) DIRECT SVERSE RILL FR UNDERS	MAN SCAN	O (ZUTO SE RÍBE AN USING OLE LL-REAMEI		
Flus	Perpendicularity, .001 in./gage length  Longitudinal. <u>ao2/wcr.</u> Transverse .055/wcr.  Flush Gage Reading, in025  Capacitance Gage Reading: 309 305  Air Gage Readings (.0001 in.)										
	Axial Position	0°	45°	ar Posit 90°	135°	180°	225°	270°	315°		
FAY	Bottom #1 	3000	000	) - 0 0		2 2 2			000		
Prot Perp	ace Finish, AA rusion, in. endicularity, Longitudinal, h Gage Reading	.25 .001 ir	Transvei	length	1e #2		Bluing	Pin Rollo	out		
	citance Gage R	leading:		27		322 227	70-	,			
	Pathophi shoude hamada basan e	<u>Ai</u>	r Gage F Angul	Readings ar Posit	(,0001 ir ion	<u>1.)</u>			-		
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°		
FAY -	Bottom #1 #2 #3 #4 #5	0000	3000	0000	0	0	0	) 0	0 0 0		
•											

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Test Series	Quality Varia	ible P	ERPEN	OLCULAR	ITY DE	VIATION	- 3°			
Produce Good Hole Usin Tools: #2 Centerdril Spindle, rpm 3 Cutting Fluid: 5700	l; 19/64 in. p	ilot dri	11; Group Feed:		Drill R	eamer (TL	.D2040AR1-5			
Modify Good Holes Using Following Conditions:  Tool: VANDERSIZE OMARK DRILL REAMER  Spindle, rpm 325 Feed: HAND -0.5 IPM  Cutting Fluid: STODDARD SOLVENT Depth: (Ind. Reading) / 8/0  Procedure: SET HEAD ANGLE 3' IN TRANSVERSE DIRECTION, SCRIBE  HULE LOCATION, POSITION TABLE IN TRANSVERSE DIRECTION USING  CENTERING MICRUSCOPE IN SPINDLE - DRILL & REAM HOLE  SHALLOW BY -060" THEN COSINIK WITH UNDERSIZE DRILL-REAMER  Results: Specimen No. 5A/CT Hole #1  Surface Finish AA 3/1										
Surface Finish, AA 36  Protrusion, in. 255  Perpendicularity, .001 in./gage length  Longitudinal .004/wch Transverse .053/ws.  Flush Gage Reading, in. ,030  Capacitance Gage Reading: 301										
Air Gage Readings (.0001 in.)  Angular Position										
Axial Position	0° 45°	90°	135°	180°	225°	270°	315°			
#2 #3 #4 #5	C 0 0 0 0 0	0 + 0 5	0	0 0 0	0 0 0 0	0 0 0 0	0 0 0			
Surface Finish, AA Protrusion, in. Perpendicularity, .( Longitudinal <u>oo</u> Flush Gage Reading,	Transver	ength		<b>3</b>	X	in Rollo	ut			
Capacitance Gage Rea	Capacitance Gage Reading: 543 383 420  Air Gage Readings (.0001 in.)  Angular Position									
Axial Position	0° 45°	90°	135°	180°	225°	270°	315°			
Bottom #1 #2 #3 #4	0 0 0 0 0 0 0 0	00 .	) 	.00 	<u></u>	+ 5.5	2 2 2			
1 15 1 1/4-7:										

INSPECTION SHEETS FOR TEST SERIES 8 - BARRELLING

MANUFACTURING REPORT: TAPERED HOLES										
Test S Specim	eries <u>8</u> en No. <u>402 f</u>	Qual	ity Vari	iable <u>H</u>	MIN.	RELLIN	G (.00	23)		
	Hole Manufacturing Conditions and Procedures: TAPER REAM WITH GROUP  II REAMER, FEED BORING BAR WTO HOLE AND TOWAR ON DIA.  BORE HOLE TO DEPTH OF .SBS" NOSE RADIUS: "A"  Spindle, rpm 660 Feed: .00/5/PR  Cutting Fluid: DRY Depth: (Ind. Reading) 1.160									
Prot Perp L Flus Capa	Surface Finish, AA 55 Hole #1 Protrusion, in. /26 Perpendicularity, .001 in./in. Longitudinal .001 Transverse O Flush Gage Reading, in. Capacitance Gage Reading .257 Exit Burr Height, in.									
	Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	9.0 9.0 -2.0 -2.0	8.0 7.0 4.0 1.5 -1.0	8.0 6.0 6.0 3.0 1.5	4.0 4.0 -8.0 -3.0	11. C 13. O 9. O 6. O 8. O	11.0 14.5 5.0 5.0 14.5	13.0 15.0 4.0 8.0 14.0		
Proti Perpo [ Flust Capac	Surface Finish, AA 55 Bluing Pin Rollout Protrusion, in//7 Perpendicularity, .001 in./in. Longitudinal .002 Transverse .003 Flush Gage Reading, in0 Capacitance Gage Reading .237 Exit Burr Height, in.									
	Air Gage Readings (,0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4	13.0 14.0 10.0 9.0	13.0 14.0 14.0 11.0	13.0 14.0 13.0 11.5 10.0	11.5 14.0 11.5 9.0	12.0 14.0 8.0 6.0	13.0 14.0 5.0 3.0 9.0	13.0 14.0 7.0 5.0		

	MA	NUFACTU	RING REP	ORT: T	APERED H	IOLES				
Test Se Specime	ries <u>8</u> en No. <u>346</u> /	Qual	ity Vari	able <u>He</u>	MIN.	RELLIN	G (.00 ERENCE	23)		
		ED DOR	WC BAR	ANTO HO BS" Fe	Nose A	PER RE Tauch Capins .00 nd. Read	ON DIE EYA" IS IPR	TN GROUP 1		
Surface Finish, AA 60  Protrusion, in. 72/ Perpendicularity, .001 in./in. Longitudinal <u>co2</u> Transverse <u>002</u> Flush Gage Reading, in. <u>0</u> Capacitance Gage Reading .246 Exit Burr Height, in.										
		<u>A</u>	ir Gage Angu	Reading lar Posi		1 in.)	e e L			
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	12.0 12.0 10.0 8.0	11.0	11.0	10.0 9.5 5.0 2.0	10.0 10.0 4.0 4.0	11.0	11.0		
Protr Perpe L Flush Capac	Hole #2  Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse .002  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.									
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	11.C 10.0 1.0 0	10 0 1 <b>c</b> 0 <b>6</b> 0 <b>2</b> 0 3.0	11.0 10.0 5.0 1.0 3.5	10.0 10.0 4.0 4.0	10 0 10 0 5 0 1.0 2.5	11.0 10.0 6.0 1.5	11.0 100 6.0 2.0 3.0		

	MA	NUFACTU	RING REP	ORT: T	APERED I	10LES				
Test Se Specime	eries <u>8</u> en No. <u>225</u>	Qual	ity Vari	able <u>H</u>	MIN.	INTERF	G (.00 FRINCE	23)		
<u></u>	Hole Manufacturing Conditions and Procedures: TAPER REAM WITH GROWD  II REAMER, FEED BORING BAR INTO HOLE RUD TOMEN ON DIA.  BORE HOLE TO DEPTH OF .SBS" Nose RADINS = YA"  Spindle, rpm 660 Feed: .0015 IPR  Cutting Fluid: DRY Depth: (Ind. Reading) 1.160									
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse .0015  Flush Gage Reading, in.  Capacitance Gage Reading .304  Exit Burr Height, in.										
		<u>A</u>	ir Gage Angu	Reading lar Posi		<u>1 in.)</u>	' 1	<b>48</b> 0.		
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	12.0	11.0	12.0	10.0	9.0	10.0	11.5		
	#2	95	10.5	10.0	9.0	7.5	8.5	9.5		
	#4	12.0	815	2.0	2.5	40	6.0	7.5		
	#5	12.0	14.0	13.0	13.0	14.0	13.0	14.0		
Protr Perpe L Flush Capac	Surface Finish, AA 50  Protrusion, in									
	Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	#3 #4	11. C 11.5 10. C 8. S 15. O	11.0 11.0 10.0 7.5 15.0	12.5 13.5 13.0 9.0	10.0 10.0 7.5 4.5	13.0 13.0 11.0 8.0 15.0	11.0 14.5 8.5 4.5 13.0	11.0 10.5 9.0 11.0		

	M/	ANUFACTU	RING REP	ORT: T	APERED	HOLES				
Test S Specim	eries 8 en No. 302	Qual	ity Vari	able <u>H</u>	MIN.	INTERF	G (.00 ERFUCE	23)		
Spi		Condition For Borners  DEPTORES  DRY	ons and	<i>85"</i> F	Nose eed:	PER RE TAUCH RADINS .00 Ind. Read	= Ya" IS IPR	TH GROUP 4		
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal 20025 Transverse .0015  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.										
		A	ir Gage	Reading		1 in.)	•			
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	4.5	4.0	4.0	3.0	3.0	3.0	5.0		
	#2	5.0	4.0	4.0	1,5	3.0	3.0	6.0		
	#4	3.0	1.5	7.0	5.0	7.0	5.0	2.5		
Prot Perp Flus Capa	Surface Finish, AA  Protrusion, in.  Longitudinal  Capacitance Gage Reading Exit Burr Height, in.  Hole #2  Bluing Pin Rollout  Bluing Pin Rollout  Bluing Pin Rollout  A D D D D D D D D D D D D D D D D D D									
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	4.0	3.5	3.0	4.0	3.5	3.0	3,5		
	#2	3.5	5.0	1.5	4.0	1.0	2.5	5.0		
	#4	5.0	3.0	3.0	7.0	-4.0	50	4.0		
		<u> </u>			<del></del>		استخطاعها			

MANUFACTURING REPORT: TAPERED HOLES										
	Test Series 8 Quality Variable Holf BARRELLING (.0023) Specimen No. 3A1T MIN. INTERFERENCE									
Hole Manufacturing Conditions and Procedures: TAPER REAM WITH GROUP  THE REAMER, FEED BORING BAR INTO HOLE PAND TOUCH ON DIA.  BORE HOLE TO DEPTH OF .SBS" NOSERBOINS = YA"  Spindle, rpm 660 Feed: .0015 IPR  Cutting Fluid: DRY Depth: (Ind. Reading) 1.160										
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal _O Transverse _O  Flush Gage Reading, in										
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	12.0 12.0 12.5 10.0	12.0 11.0 11.0 9.0	14.0 13.0 12.0 6.0	10.0 9.0 6.0 7.0 14.0	11.0 10.0 8.0 6.0 14.0	12.0 11.0 11.0 8.0	12.0 12.0 11.5 9.0		
Proti Perpe l Flush Capac	Surface Finish, AA 45  Protrusion, in//2  Perpendicularity, .001 in./in.  Longitudinal .0015 Transverse .002  Flush Gage Reading, in002  Capacitance Gage Reading .232  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	#2 #3 #4 #5	11.0 11.0 9.0 6.0 6.0	11.0 11.0 9.0 5.0	12.0 11.0 9.0 5.0 1.5	11.0 10.0 7.0 3.0	11.0 10.0 7.0 4.0 3.5	13.0 13.0 10.0 2.0 3.0	13.0 13.0 11.0 7.0 3.0		

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>8</u> en No. <u>2,8</u> (1)	Qual	ity Vari	able <u>H</u>	MIN.	RELLIN	G (.OU FRENCE	23)			
	Hole Manufacturing Conditions and Procedures: TAPER REAM WITH GROWP  II REAMER, FEED BORING BAR INTO HOLE AND TOWAR ON DIA.  BORE HOLE TO DEPTH OF .SBS" NOSE RADIUS : Ya"  Spindle, rpm 660 Feed: .00/5/PR  Cutting Fluid: DRY Depth: (Ind. Reading) 1.160										
Hole #1											
Surface Finish, AA 60  Protrusion, in. 124  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse .001  Flush Gage Reading, in0  Capacitance Gage Reading .222											
	Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
	Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2	5.0	5.0	6.5	2.5	4.5	4.0	4.5			
	#3 #4 #5	3.0	2.5	3.5 1.5 10.0	-3.5° 7.0	1.5	2.0 -3.0 5.0	1.0			
Protr Perpe L Flush Capac	Surface Finish, AA Protrusion, in. Perpendicularity, .001 in./in. Longitudinal /00/ Transverse .004 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	2.0 4.5 2.0 2.0 1.0	4.0 5.0 2.0 -3.0 -4.0	4.0 5.0 2.0 -2.0	3.5° 5.0° 2.5° 1.0°	4.0 5.0 3.5 .0 2.0	3.5 5.0 4.0 1.0	3.0 5.0 3.5 .0			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>8</u> en No. <u>104</u>	Qua 1	ity Vari	able <u>H</u>	MIN.	RELLIN	a (.00	23)			
<del>Z3</del> Spir	Hole Manufacturing Conditions and Procedures: TAPER REAM WITH GROWN  II REAMER, FEED BORING BAR INTO HOLE PAUD TOUGH ON DIA.  BORE HOLE TO DEPTH OF .SBS" NOSE RADINS " YA"  Spindle, rpm 660 Feed: .00/5 /PR  Cutting Fluid: DRY Depth: (Ind. Reading) //60										
Surface Finish, AA 55 Hole #1  Protrusion, in/22  Perpendicularity, .001 in./in.  Longitudinal O Transverse O  Flush Gage Reading, in.  Capacitance Gage Reading 204  Exit Burr Height, in.											
Air Cage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	12.0	11.5	110	11.0	11.0	14.0	11.0			
	#2	90	8.0	10.0	7.0	180	100	10.5			
	#4	20	5.0	3.0	8.0	3.0	80	4.5			
	#5	15.C	13.0	7.0	14.0	14.0		13.0			
Prot Perpo Flusi Capac	Surface Finish, AA 50  Protrusion, in. 109  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse 0  Flush Gage Reading, in. 10  Capacitance Gage Reading Exit Burr Height, in.										
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	12.0	12.0	12.0	10.5	100	105	11.0			
	#2	11.0	11.5	11.0	10.0	10.0	7.0	40			
	#3 #4	2.5	4.5	4.0	20	-2.0	2.0	2.0			
`	#5	4.0	3.0	5.0	3.0	1.0	3.0	6.0			

	MA	NUFACTU	RING REP	ORT: T	APERED I	HOLES					
Test Se Specime	ries <u>8</u> n No. <u>5AL</u>	Qual	ity Vari	able <u>H</u>	MIN.	INTERF	a (.00 ERENCE	23)			
Spin	Hole Manufacturing Conditions and Procedures: TAPER REAM WITH GROWP  II REAMER, FEED BORING BAR INTO HOLE AND TOWAR ON DIA.  BORE HOLE TO DEPTH OF .SBS" NOSE RADINS * YA"  Spindle, rpm 660 Feed: .00/5 /PR  Cutting Fluid: DRY Depth: (Ind. Reading) 1.160										
Prot Perpo Lo Flusi Capac	Surface Finish, AA 50 Hole #1  Protrusion, In.  Perpendicularity, .001 in./in.  Longitudinal .col   in.   col   col    Flush Gage Reading, in.  Capacitance Gage Reading .196  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	14 0 14 C 13 C 11 C	11.0 11.0 9.0 6.0 14.0	10.0 9.0 5.0 3.0 4.0	11.0 9.0 5.0 3.0 14.0	12.0 11.0 1.0 3.0 13.0	11.0 11.0 9.0 6.0 14.0	11.0 10.0 9.0 12.0			
Protr Perpe L Flush Capac	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse .0015  Flush Gage Reading, in002  Capacitance Gage Reading .2/5  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
-	#2 #3 #4 #5	11.0 11.0 9.0 14.0	11. C 11. O 9. O 7. O	11.0 11.0 7.0 14.0	9.0 9.0 7.0 13.0	12.0 12.0 9.0 7.0	12.0 13.0 10.0 8.0	10.0 10.0 18.8 13.0			

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 8 Specimen No. 204	Qual <u>ナ</u>	ity Vari	able <u>H</u>	MIN.	RELLIN	G (.00	23)				
Hole Manufacturing <i>II REAMER</i> , F	eeo dor	ING BAL	MITO NO	IE HUL	TOWAN	ON DIA	TN GROUP				
Spindle, rpm Cutting Fluid:	BEATA BED DRY	<u> </u>		ed:			1.160				
Surface Finish,	AA	60	Hole #1		Blu	ing Pin	Rollout				
Protrusion, in											
Longitudinal	Longitudinal <u>OCI</u> Transverse <u>O</u> Flush Gage Reading, in. <u>OCI</u>										
Capacitance Gage Reading 187 201 Exit Burr Height, in.											
Air Gage Readings (.0001 in.)											
Angular Position											
Axial Position	0°	45°	90°	180°	225°	270°	315°				
Bottom #1	12.0	14.0	13.0	13.0	11.0	12.0	12.0				
#2	10.5	13.0	13.0	12.0	7.0	10.0	11.0				
#4	8.0	11.0	9.0	11.0	9.0	8.0	9.0				
	1/3.0					V 7·0					
Surface Finish,	AA	60	lole #2		Blui	ng Pin F	Rollout				
Protrusion, in. Perpendicularity		0 n./in.									
Longitudinal	.001	Transver	. ,	15	1	carre					
Flush Gage Readi Capacitance Gage		- 20		_ ;	20/18	100000000000000000000000000000000000000					
Exit Burr Height	, in	-		_	ţ						
Air Gage Readings (.0001 in.) Angular Position											
Axial Position	0°	45°	90°	180°	225°	270°	315°				
Bottom #1	13.0	14.0	12.0	11.0	10.0	10.0	12.0				
#2	8.5	11.0	9.0	10.0	4.0	10.0	9.0				
#4	13.0	8.0	15.0	15.0	3.0	5.0	7.0				

	M/	ANUFACTU	RING REF	PORT: T	APERED I	HOLES					
Test So Specime	eri <b>es <u>8</u></b> en No. <u>5/2/</u>	Qual	ity Vari	iable <u>H</u>	MIN.	INTERF	G (.00	23)			
	REAMER, FACE 7, ndle, rpm (ting Fluid:	DEPT.	INGBAR	185"	Nose	PER RA Tauch Rapins .00 Ind. Rea	= VA" IS IPR	IN GROUP A			
Prot Perp L Flus Capa	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .00/5 Transverse .001  Flush Gage Reading, in002  Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	#2 #3 #4 #5	12.0 10.0 8.5 15.0	12.5 11.5 9.0 6.5	12.0 12.0 8.0 6.0	10.0 8.5 2.0 140	10 0 9.5 7.0 6.0 14.0	11.0 10.0 5.0 4.0 13.0	12.0 12.0 <b>9</b> .0 7.0 13.5			
Prot Perp Flus Capa	Surface Finish, AA  Protrusion, in										
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	11.0 12.5 12.0 10.5	13.0 13.0 13.5 11.0	12.0 13.0 12.0 10.5	11.0 11.0 9.5 7.0 15.0	10.0 9.0 5.0 1.5 13.0	12.C 12.G 10.5 9. O	12.C 12.C 11. C 9.0 15.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>8</u> en No. <b>(722</b> )		ity Vari	able _	HOLE &	ARRE × INT	LLING	(.0048) ENCE		
<i>Fe</i> ر صب Spir	enufacturing  ED BORING  DIA OFNOLE  Indle, rpm  ting Fluid:	BAR AS	TO HOLE	. 100". DEPTH OF	Hove	Nose	RADIUS FIRE	Touch		
			,	Hole #1						
	face Finish, a rusion, in.		0			Blu	ing Pin	Rollout		
Perpendicularity, .001 in./in.										
Longitudinal <u>.00/5</u> Transverse <u>.003</u> Flush Gage Reading, in003										
Capacitance Gage Reading . 236 25/0										
Exit Burr Height, in.										
Air Gage Readings (.0001 in.)										
Angular Position Axial										
	Position	0°	45°	90°	180°	225°	270°	315°		
	Patter #1	20	5-	1.0	2 -	20	2 0	2.5		
	Bottom #1 #2	1.5	.5	1.0	2.0	2.5	2.5	2.0		
	#3	1.0	1.0	1.0	2.0	2.5	2.0	2.0		
	#4	7.5	30	2.0	1.5	3.2	1.5	1.5		
					<u> </u>	101-3	1370			
Surf	ace Finish, A	Δ /	60	lole #2		Rlui	na Pin	Rollout		
Proti	rusion, in.				_	<u> </u>				
Perpe	rusion, in endicularity,	.001 ir	n./in.		•	*	1 3			
	Longitudinal h Gage Readin		ransver	se .60	<u> </u>	·d =				
Capac	citance Gage	Reading	, 23	7	_ 3	1/3 =				
Exit	Burr Height,	in.			_	-		32		
		Ai	r Gage	Readings	s (.0001	in.)				
Angular Position										
	Axial									
	Position	0°	45°	90°	180°	225°	270°	315°		
ļ	Bottom #1	2.5	2.5	2.5	2.5	2,5	2.5	2.5		
ļ	#2	2.0	2.0	2.0	2.0	2.0	1.0	2.0		
	#3	1.0	1.5	15	1.5	1.5	2.0	1.0		
	#5	3.5	3.5	3.5	3.5	3.0	3,5	3.5		

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	ries <u>8</u> in No. <u>5782</u>	Qual	ity Vari	iable Z	HOLE &	ARRE.	L!ING	(.0040) ENCE			
FEE	Hole Manufacturing Conditions and Procedures: TAPER REAM STO. HOLE  FEED BORING BAR INTO HOLE . 100" HOVE ECCENTRIC TO TOUCH  ONDIR OF MOLE BORE HOLE TO DEPTH OF . 585" NOSE RADIUS : 10 IN.										
Spin	Spindle, rpm 325 660 Feed: .00/5 /PR Cutting Fluid: DRY Depth: (Ind. Reading) 1.675										
Surface Finish, AA 50 Bluing Pin Rollout											
Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .0005 Transverse .001											
Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.											
Air Gage Readings (.0001 in.)											
	Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 2,5 2.5 2.0 2.0 2.0 2.0										
	#2	1.5	1.5	2.0	1,5	1.0	1.0	1.5			
	#4	1.0	1.0	1.0	3.0	3-	1.6	1.0			
		5.0	13.0	15.0	13.0	13.0	13.0	13.17			
Protr	Surface Finish, AA Protrusion, in.  Hole #2 Bluing Pin Rollout										
L	endicularity, ongitudinal,	0005	n./in. Transve	rse .00	2			*			
Flush Gage Reading, in. Capacitance Gage Reading											
Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 2.5 2.5 2.0 2.0 2.0 2.5 2.5										
	#2	1.5	2.0	1.5	1.5	1.5	3.0	2.0			
	#4	.5	1.5	1.0	1.0	1.5	1.0	1.0			
[	#5	3.0	3.0	3.0	3.0	3.5	3.0	3.5			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>8</u> en No. <u>58/0</u>	Qual	ity Vari	able Z	HOLE 8	ARRE.	CLING	(.0048) ENCE			
FEE	nufacturing  ED BORING  DIA OF HOLE  Indle, rpm  ing Fluid:	GAR L	TO HOLE	.100"	Move	ECCEN	TRIC TO	Touch			
Prot Perp L Flus Capa	Surface Finish, AA 50  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse 00/ Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings ( 0001 in )										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2	3.5	3.5	3	2,5	2.5	3	3.5			
	#3	3	3	5.2	1.5	15	2.5	3			
	#4	2.5	2.5	2	1	1	2	2.5			
	#5	2	2	1.5	1.5	1.5	1.5	2			
Protr Perpe L Flush Capac	Surface Finish, AA 55  Protrusion, in. ,210  Perpendicularity, .001 in./in.  Longitudinal .003 Transverse .001  Flush Gage Reading, in. Capacitance Gage Reading 246  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	3	3	3	3	3	3	3			
	#2	3	3		2.5	2.5	3	3.5			
}	#3 25 2.5 2.5 2 2 2.5 2.5 #4 2 2 2 2 2										
	#5	1		L	1	1	1	1.5			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>8</u> en No. <u>5850</u>	Qual	ity Vari	able Z	HOLE B	ARREA × INTE	RFFR	(.0048) ENCE			
<i>Fea</i> میرو Spin	nufacturing  Do Borne  Do OFFORE  dle, rpm  ing Fluid:	BOAF A	TO HOLE Cost To 1	. 100" DEPTH OF	MOVE	Nose A	PADIUS	Touch			
Prot Perp Li Flus Capa	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse .002  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings ( 0001 in )										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	2.5 2 1.5 1	2 1.5 1 1,5	2.5	3.5 3 2.5 1.5	3.5	3.5	35			
Protr Perpe L Flush Capac	Surface Finish, AA 65  Protrusion, in										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	3.5 3 2.5 2	3 25 2 1.5 3.5	3 2,5 2 1,5 3,5	3 2,5 2 1,5	3 2 2 1,5 3.5	3 3 2.5 2	3 25 2 2 3.5			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>8</u> en No. <u>5<i>E</i> 2</u>	Qual	ity Var	iable _	HOLE E	X INT	LLING	(.0048) ENCE			
<i>Fe</i> مرم Spir	enufacturing  ED BORING  DIA OF HOLE  ndle, rpm  ting Fluid:	BAR LA BOAF L	To Hour	DE 100"	Move	Nose.	RADIUS FIPR	· Youch			
Hole #1  Surface Finish, AA 60  Protrusion, in. 1339  Perpendicularity, .001 in./in. Longitudinal,00/\$ Transverse .0035  Flush Gage Reading, in. + .005 Capacitance Gage Reading 234											
Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2	1.5	0	5	2.5	3	3	2.5			
	#3	0	1.5	7	Z	2,5	2.5	2			
	#4	15	2.5	2.5	2	2.5	2.5	2			
Protr Perpe i Flush Capac	Surface Finish, AA 50  Protrusion, in. 246  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse .0005  Flush Gage Reading, in. + .0015  Capacitance Gage Reading 227  Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
	Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	1.5	2.5	1.0	2.0	2.5	2.5	2.5			
	#2	20	1.0	1.0	1.5	2.9	2.5	2,5			
-	#3	1.5	1.5	115	0.5	- 3	F. 5	1.0			
	#5	3.0	3.0	3.0	3.0	3.0	3.0	3.0			

Test Series 8 Quality Variable Hole BARRELLING (.0048) Specimen No. 1C5/3  Hole Manufacturing Conditions and Procedures: TAPERRAM STO. Hole Feed Boards Garriage To Decree 1885." Nas Robins 18 To No. 100 May Spindle, rpm 25660 Feed: .00/5 MR Utting Fluid: DRY Decree 1885." Nas Robins 18 To No. 100 MR Cutting Fluid: DRY Decree 1885." Nas Robins 18 To No. 100 MR Cutting Fluid: DRY Depth: (Ind. Reading) 1675  Surface Finish, AA Hole #1  Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315° Bottom #1 1.5 1.0 1.0 2.0 2.5 2.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	MANUFACTURING REPORT: TAPERED HOLES											
Surface Finish, AA	Test Series 8 Quality Variable HOLE BARRELLING (.0048) Specimen No. 2653 MAX INTERFERENCE											
Surface Finish, AA	FEED BORING BAR WIO HOLE . 100" HOVE ECCENTRIC TO TOUCH ON DIA DEMOLE BORE HOLE TO DEMTH OF . 585" NOSE RADIUS . 10 1N. Spindle, rpm 325 660 Feed: .0015 IPR											
Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 1.5 1.0 1.0 2.5 3.0 2.5 2.0 #2 #3 0 1.0 1.5 1.5 1.5 2.0 1.5 #4 1.0 0 1.5 1.5 1.5 2.0 1.0 #5 3.0 3.5 3.0 3.5 3.0 3.5 3.0 3.0 3.5 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Surface Finish, AA 4/5 Bluing Pin Rollout Protrusion, in. 239 Perpendicularity, .001 in./in. Longitudinal .00/5 Transverse .00/ Flush Gage Reading, in. 200/5 Capacitance Gage Reading .240 Exit Burr Height, in.  Air Gage Readings (.0001 in.) Angular Position											
#2	Axial											
#3			1.5	1.0	1.0	2.5	3.0	2,5	2.0			
#5 3.0 3.5 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0			0	1.0	1.0	2.0	2.5	2,0	1.5			
Surface Finish, AA			1.0	3.5	1.5	1.5	2.5	2.0	1.0			
Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 2.5 2.0 2.0 2.5 2.5 2.5 2.5   #2 2.0 2.0 1.5 2.0 2.0 2.0 2.0 5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1	Surface Finish, AA 55 Bluing Pin Rollout Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .005 Transverse Flush Gage Reading, in. Capacitance Gage Reading .237 30%											
Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 2,5 2.0 2.0 2.5 2.5 2.5 2.5  #2 2.0 2.0 /.5 2.0 2.0 2.0 2.0 3.0  #3 1.5 /.0 /.0 /.5 /.5 /.5	Air Gage Readings (.0001 in.) Angular Position											
#3 1.5 1.0 1.0 1.0 1.5 1.5 1.5 #4 .5 .5 1.0 .5 1.0 1.0	Axial Position 0° 45° 90° 180° 225° 270° 315°											
#3 1.5 1.0 1.0 1.0 1.5 1.5 1.5												
#4 .5 1.0 .5 1.0 1.0												
		#4	2.6			3 10	1.0	1.0	1.0			

MANUFACTURING REPORT: TAPERED HOLES											
Test S Specim	eries <u>8</u> en No. <b>2</b> <i>0</i> <b>3</b> 7	Qual	ity Vari	able Z	HOLE E	ARRE X /NT	LLING ERFER	(.0048) ENCE			
FE. ON Spir	Hole Manufacturing Conditions and Procedures: TAPER REAM STO. HOLE  FEED BORING BAR WIS HOLE, 100", MOVE ECCENTRIC TO TOUCH  ONDIA OFHOLE BORE HOLE TO DEPTH OF, 585" NOSE RADIUS = 1/8 IN.  Spindle, rpm 325 660 Feed: .00/5 1PR  Cutting Fluid: DRY Depth: (Ind. Reading) 1.675										
Surface Finish, AA 50  Protrusion, in											
Angular Position  Axial											
		9 4	2.0	سے ر	100	-	2.0	315			
	Bottom #1 #2	1.5	1.5	1.0	1.3	1.0	1.5	1.5			
	#3	1.3-	1.0	1.9	0.	.0	10	15			
	#5	3.0	3.0	3.0	2.5	3.0	2.5	2.5			
Prot Perp Flus Capa	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .00/ Transverse .002  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 2.0 2.0 2.0 2.0 2.0 2.0 2.0										
	#3 1.0 1.0 1.0 1.0 1.0 1.0 1.5										
	#4	.5	.0	.0	0	.0	.5	-5-			
	#5	2,5	2.5	3.0	2.5	2.5	3.0	4.5			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries 8 en No. <b>503</b>	Qual	ity Vari	iable ∠	HOLE &	ARRE.	LLING	(.0048) ENCE			
<i>Fea</i> مم Spir	enufacturing  En Borne  Din of House  adle, rpm  ing Fluid:	BAR LA BOREL 925	Hous To	DEPTH 6	. 585" eed:	NOSE!	CADIUS	· YOUCH			
				Hole #1							
	Surface Finish, AA 60 Bluing Pin Rollout Protrusion, in 243										
Perp L Flus Capa	Perpendicularity, .001 in./in. Longitudinal .0005 Transverse .001 Flush Gage Reading, in. Capacitance Gage Reading .237 Exit Burr Height, in.										
Air Gage Readings (.0001 in.)											
Angular Position Axial											
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	1.5	1.0	1.0	3.0	3.0	3.0	2.0			
	#2	-3-	1.0	0	2.5	2.5	3.5	1.5			
	#4	0	1.5	1.0	2.0	2.0	1.5	3			
	#5	3,0	3.5	3.0	3.0	3.5	3.0	3.0			
Proti Perpe l Flush Capac	Surface Finish, AA 55 Bluing Pin Rollout Protrusion, in. 246 Perpendicularity, .001 in./in. Longitudinal O Transverse .0015 Flush Gage Reading, in001 Capacitance Gage Reading Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 2.5 2.0 2.0 2.0 1.0 2.5 2.0										
	#2 2.0 2.0 2.0 1.5 1.5 2.0 2.0										
	#3	1.5	1.0	7.0	1.6	1.0	2.0	1.0			
	#5	3,5	3.5	3.0	3.5	3.5	3.5	3.5			

	МА	NUFACTU	RING REF	ORT:	TAPERED I	HOLES	· · · · · · · · · · · · · · · · · · ·				
	eries <u>8</u> en No. <u>5A5</u>		ity Vari	able	HOLE E MA	ARREA X INTE	RFFR	(.0048) ENCE			
FEE ON Spin	nufacturing of Borne Don OFNOCE dle, rpm 3 ing Fluid:	BAR L	TO HOLE	. 100°	#.585" eed:	EGGEN	PADIUS	Touch			
Prot Perp Lo Flusi Capad	Surface Finish, AA 75 Bluing Pin Rollout Protrusion, in. 721 Perpendicularity001 in./in. Longitudinal 7 Transverse .00/ Flush Gage Reading, in003 Capacitance Gage Reading 237 Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	3	3	3	3	2.5	3	3			
	#2	3	25	5.5	2	2.5	3	3			
	#4	2.5	2	2	2	1.5	/.3	1.5			
	#5	3	3	3	25	3.5	.3	3			
Protr Perpe L Flush Capac	Surface Finish, AA Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .001 Transverse .0025 Flush Gage Reading, in. Capacitance Gage Reading 257 Exit Burr Height, in.										
ſ	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
-	#2 #3 #4 #5	3 2.5 2.5 2 /·5	3 2.5 2.5 1	2.5 2 2 1.5 1	+2.5 +2 +1.5 +1	+2,5 <b>#2.</b> 5 <b>/.</b> 5 <b>.</b> 5	3, 2.5 2	3. 2.5 2 /			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 8 Quality Variable HOLE BARRELLING (.0040) Specimen No. 4047 MAX INTERFERENCE										
Hole Manufacturing Conditions and Procedures: TAPER REAM STO. HOLE  FEED BORING BAR INTO HOLE . 100" MOVE EGGENTRIC TOTOUGH  ONDIA OFHOLE BORE HOLE TO DEPTH OF .585" NOSE RADIUS . 18 12.  Spindle, rpm 660 Feed: .0015 1PR  Cutting Fluid: DRY Depth: (Ind. Reading) 1.675										
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal  Transverse  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	#1 #2 #3 #4 #5	2.0	2.0 1.5 1.5 2.5	2.0	1.5	2.0 1.0 .5 .0	2.0 1.0 1.0 2.5	1.5		
Surface Finish, AA										
Air Gage Readings (.0001 in.) Angular Position Axial										
	Position	0°	45°	90°	180°	225°	270°	315°		
	#2 #3	2.0	2.0	1.5	1.0	1.0	1.0	1.5		
ŀ	#4 #5	3.0	3.0	1.5	3.0	3.0	3.0	3.0		

INSPECTION SHEETS FOR TEST SERIES 8 - BELLMOUTHING

MANUFACTURING REPORT: TAPERED HOLES									
Test Series 8 Quality Variable BEAL MONTHING  Specimen No. 213/13 MIN. INTERFERENCE									
Hole Manufacturing Conditions and Procedures: PRODUCE STO HOLE  BORE EXIT OF HOLE AND CHAMFER ENTRANCE WITH A  60° COUNTRESINE  Spindle, rpm 660 Feed: 00/5 /PR  Cutting Fluid: Der Depth: (Ind. Reading)									
Hole #1									
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse .004  Flush Gage Reading, in002  Capacitance Gage Reading Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1	7.0	7.0	70	8.0	8:0	8.0	7.0		
#2	5.0	2.0	2.0	90	3.0	5.0	9.0		
#4	5.0	20	2.0	90	3.0	4.0	20		
. #5	7.0	7.0	14.0	19.0	4.0	14.0	6.0		
Surface Finish, AA Protrusion, in. Perpendicularity, .001 in./in. Longitudinal O Transverse .003 Flush Gage Reading, in. Capacitance Gage Reading 220 Exit Burr Height, in.									
Air Gage Readings (.0001 in.)  Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1	8.0	6.0	7.0	6.0	5.0	8.0	9.0		
#2	7.0 3.0	8.0	80	4.0	8.0	8.0	11.0		
#4	5.0	1.0	8.0	5.0	4.0	6.0	10.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 8 Quality Variable BELL MONTAING Specimen No. 3C2B MIN. INTERFERENCE										
Hole Manufacturing Conditions and Procedures: PROPULE STO HOLE  BORE EXIT OF HOLE HAD CHANFER ENTRAUGE WITH B.  60° COUNTRESINE  Spindle, rpm 660 Feed: 0015 IPR										
	Spindle, rpm 660 Feed: 0015 IPP Cutting Fluid: Depth: (Ind. Reading)									
Hole #1 Surface Finish, AA So Bluing Pin Rollout										
Prot	rusion, in.	123	50			To Department				
	endicularity ongitudinal			se 100	2	,		• • •		
	h Gage Readii citance Gage		26	,		1. 1/1 C		'M		
	Burr Height						•			
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	00	45°	90°	180°	225°	270"	315"		
	Bottom #1	4.0	5.0	60	80	6.0	4.0	60		
	#2	5.9	4.0	5.0	80	120	5.0	8.0		
	11	40	-3.0	1.0	50	20	60	80		
	#5	7.0	-1.0	-2.0	120	1.0	60	9.0		
Surface Finish, AA Protrusion, in. Perpendicularity, .001 In./in. Longitudinal 1001 Transverse .0015 Flush Gage Reading, in001 Capacitance Gage Reading 253 45% Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	6.0	5.0	8.0	60	5.0	4.0	7.0		
	#2	7.0	20	6.0	80	50	5.0	20		
		3.0	20	4.0	1.0	5.0	30	1.0		
[	//5	1.0	6.0	60	3.0	6.0	5.0	1.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 8 Quality Variable BELL MONTHING Specimen No. 2858 MIN. INTERFERENCE										
Hole Manufacturing Conditions and Procedures: PRODUCE STO HOLE  BORE EXIT OF HOLE AND CHAMFER ENTRANCE WITH A  60° COUNTERSINK  Spindle, rpm 660 Feed: 2005 IPR										
Spindle, rpm 660 Feed: 00/5 /PR Cutting Fluid: Der Depth: (Ind. Reading)										
Hole #1										
	ace Finish, rusion, in.		35			Blu	ing Pin	Rollout		
Perp	endicularity	, .001			14		^	239		
	ongitudinal h Gage Readi		Transver	se 100	<b>4</b> _ ,	40%	- management of			
Capa	citance Gage	Readin	9 28	8		7011		, ,		
Exit	Burr Height	, in								
		1	Air Gage	Reading	gs (.000	1 in.)		A PROPERTY OF		
	Axial	<del></del>	Angu	lar Pos	ition	<del></del>	<del></del>	<del></del>		
	Position	0°	45°	90°	180°	225°	270°	315°		
	D-44	110	10.0	8.0	-5.0	2.0	8.0	8.0		
	Bottom #1 #2	11.0	11.0	10.0	40	2.0	5.0	9.0		
	#3	3.0	6.0	6.0	8.0	2.0	5,0	1.0		
	#4	40	1.0	1.0	6.0	12	5.0	3.0		
- <u>-</u>	" 7	17.5		17.0	13.0	1.0	13.0	140		
C	ace Finish, /	۸۸	28	Hole #2		p1:	na Pin	Rollout		
Proti	rusion, in.	12	0			0101	ilg Till			
	endicularity							1		
	ongitudinal n Gage Readi		Transvei	rse 100	24	-1	-	-		
Capac	citance Gage	Reading	26	9	<del>-</del> 3	> 40 =				
Exit	Burr Height	, in				**				
		Α	ir Gage	Reading	s (.000	1 in.) -		-		
			Angul	ar Posi	tion			1 2747945		
	Axial									
	Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	2.0	3.0	6.0	6.0	5.0	60	4.0		
	#2_	4.0	9.0	8.0	90	7.6	10.0	6.0		
	#3	-2.0	8.0	8:0	9.0	0	9.0	4.0		
	#4_	-1.0	5.0	6.0	20	1.0	4.0	2.0		

	MANUFACTURING REPORT: TAPERED HOLES									
	Test Series 8 Quality Variable BELL MONTHING Specimen No. 3058  MIN. INTERFERENCE									
_8,	Hole Manufacturing Conditions and Procedures: PROPULE STO HOLE  BORE EXIT OF HOLE HND CHANGER ENTRANCE WITH A  60° COUNTER SINK									
Spir	Spindle, rpm 660 Feed: 0015 IPR Cutting Fluid: Der Depth: (Ind. Reading)									
Surf	Hole #1 Surface Finish, AA 27 Bluing Pin Rollout									
Prot	rusion, in. endicularity	125				*	•			
L	ongitudinal h Gage Readi	1	Transver	se 100	<u>_</u> _	/				
Capa	citance Gage Burr Height	Reading	19	Ż			· .A.	METE:		
		_	Air Gage	Reading	 as (.000	01 in.)	,	1		
	Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	7.0	9.0	9.0	90	8.0	8.0	9.0		
	#3	3.0	5.0	10	3.0	5.0	3.0	3.0		
	#4	-40	2.0	0	10	11.0	120	0		
	#5	-5.0	1.0	1.0	0	-8,0	-3,0	1.0		
	·····			tole #2		······································	·			
	ace Finish, A		25			<u>Blui</u>	ng Pin	Rollout		
	endicularity		n./in.					44		
	Longitudinal		Transver	se 100	04			, ,		
	h Gage Readir citance Gage		301			/		1		
-	Burr Height,	_	301		<del></del>	m. 14		1 2 3		
						`		· Ilmings		
		<u>A</u>	ir Gage Angul	ar Posi	s (.000 tion	1 in.)				
		<del>                                     </del>		I	1	Υ	1			
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	8.0	6.0	4.0	1.0	3.0	7.0	8.0		
	#2	10.0	9.0	8.0	4.0	5,0	20	19.0		
	#3	30	5.0	6.Q 2.Q	5.0	4.0	1.0	3.0		
	#5	5.0	0	40	10	60	4.0	2.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 8 Quality Variable BEAL MONTHING Specimen No. 3A4B MIN. INTERFERENCE										
Hole Manufacturing Conditions and Procedures: PRODUCE STO HOLE  BORE EXIT OF HOLE HAD CHANFER ENTRANCE WITH A  60° COLLATER SINK										
Spindle, rpm 660 Feed: 00/5 /PR Cutting Fluid: Der Depth: (Ind. Reading)										
Hole #1 Surface Finish AA Bluing Pin Rollout										
Protrusion, in. Perpendicularity	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Bluing Pin Rollout									
Flush Gage Readir Capacitance Gage	Flush Gage Reading, in. 1001 Capacitance Gage Reading 283									
Exit Burr Height,	-									
	Air Gage Readings (.0001 in.)  Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°			
Bottom #1 #2	5.0	6.0	60	5.0	70	4.0	5.0			
# 3 # 4	3.0	4.0	8.0	3.0	4.0	2.0	2.0			
#5	4.0	-1.0	4.0	1.0	5.0	0	30			
Confees Finish A	Δ		Hole #2	<del></del>	01:	ng Pin I	Pallout			
Surface Finish, A Protrusion, in.	123		,		<u>biui</u>	ng rin i	NOTIOUT.			
Perpendicularity, Longitudinal	001		rse 100	25		. 4				
Flush Gage Readin Capacitance Gage		27			· •					
Exit Burr Height,		_e	<b>2</b>	_ `	41	1				
Air Gage Readings (.0001 in.) Angular Position										
Axial Position	0°	45°	90°	180°	225°	270°	315°			
Bottom #1	5.0	50	5.0	5.0	8.0	9.0	8.0			
#2	3.0	8.0	50	7.0	4.0	50	5.0			
#4	0	7.0	5.0	2.0	- 2.0	2.0	20			

MANUFACTURING REPORT: TAPERED HOLES									
Specimen No. VAYE Quality Variable BELL MONTHING MIN. INTERFERENCE									
Hole Manufacturing Conditions and Procedures: PRODUCE STO HOLE  BORE EXIT OFHOLE HND CHANFER ENTRANCE WITH A  60° COUNTER SINK									
Spindle, rpm 660 Feed: 0015 IPR Cutting Fluid: Der Depth: (Ind. Reading)									
Hole #1 Surface Finish, AA <u>36</u> Bluing Pin Rollout									
Protrusion, i Perpendicular	n. 100	2							
Longitudin Flush Gage Re	al <u>.o. o.</u> 1 ading, in.	ransver	1	<u>.                                    </u>	15%				
Capacitance G Exit Burr Hei		279			, • , ,		inger.		
	<u> </u>	vir Gage	Reading lar Pos		01 in.)		140 445		
Axial Position	n 0°	45°	90°	180°	225°	270°	315°		
Bottom	11 6.0	9.0	9.0	5.0	2.0	7.0	9.0		
	3 4C	8.0	4.0	20	9.0	30	5.0		
	15 7.0	5.0	2.0	2.0	9.0	1.0	2.0		
Surface Finish, AA Protrusion, in. Perpendicularity, .001 in./in. Longitudinal Transverse 1001 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #		80	8.0	60	20	60	8.0		
*	3 4.2	8.0	8.0	7.0	9.0	5.0	8.0		
#		7.0 4.0	9.0	8.0	8.0	7.0	5.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 8 Quality Variable BELL MOLITHING Specimen No. 2E2B MIN. INTERFERENCE										
Hole Manufacturing Conditions and Procedures: PRODUCE STO HOLE  BORE EXIT OF HOLE HND CHANFER ENTRANCE WITH R  60° COUNTER SINK										
Spindle, rpm 660 Feed: 0015 IPR Cutting Fluid: Der Depth: (Ind. Reading)										
Hole #1 Surface Finish, AA 23 Bluing Pin Rollout										
Protrusion, in.	126			Dia	ar regue	1000				
Perpendicularity, . Longitudinal	2 Transvei	rse 100	_	, _						
Flush Gage Reading, Capacitance Gage Re				55°/5° }	72					
Exit Burr Height, i	~									
Air Gage Readings (.0001 in.)										
Axial		lar Pos				T				
Position	0° 45°	900	180°	225°	270°	315°				
	0 8.0	6.0	4.0	15.0	70	5.0				
#2 9 #3 5	0 10.0	8.0	9.0	50	8.0	6.0				
#4	0 30	20	7.0	7.0	10	20				
		Hole #2	10.02							
Surface Finish, AA	20	noie #2		Blui	ng Pin	Rollout				
Protrusion, in. Perpendicularity, .	//9 001 in./in.					4 41				
Longitudinal . <u>gc</u> Flush Gage Reading,	75 Transve	rse, _C	2_	,	<u>_</u>	Sept.				
Capacitance Gage Rea	ading 17	4	· <b>-</b> :			3				
Exit Burr Height, in	١,				<b>k</b> 41 f	1				
	Air Gage	Reading lar Posi		<u>l in.)</u>	•	1.7				
	Airgu	1	T	<u> </u>	<u> </u>					
Axial Position	0° 45°	90°	180°	225°	270°	315°				
	0 4.0	6.0	9.0	8.0	6.0	5.0				
	#2 2.0 C.0 70 110 9.0 5.0 8.0									
#3 0 3.0 8.0 70 9.0 9.0 #4 4.0 0 5.0 0 9.0 -1.0 5.0										

MANUFACTURING REPORT: TAPERED HOLES									
Test Series 8 Quality Variable BEAL MOUTHING Specimen No. 20518 MIN. INTERFERENCE									
Hole Manufacturing Conditions and Procedures: PRODUCE STO HOLE  BORE EXIT OF HOLE AND CHANFER ENTRANCE WITH A  60° COUNTERSINE									
Spindle, rpm 660 Feed: 0015 IPR Cutting Fluid: Der Depth: (Ind. Reading)									
Hole #1 Surface Finish, AA 30 Bluing Pin Rollout									
Prot	rusion, in.	72				<u> </u>	1119 1 111	NOT TOUC	
Ł	endicularity ongitudinal	1001		se .00		,			
	h Gage Readi citance Gage		- 0	01		35 <sup>2</sup> 2			
	Burr Height		, <u></u>					À E de	
Air Gage Readings (.0001 in.)									
	Axial	Υ	Angu T	lar Pos	ition		T		
	Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1	6.0	4.0	60	8.0	60	60	6.0	
	#2	7.0	1.0	60	9.0	2.0	20	8.0	
	#4	40	-3.0	-2.0	1.0	2.0	2.0	6.0	
	#5	15.0	10	-1,0	13.0	10	-2.0	3.0	
				Hole #2					
	ice Finish, A usion, in.		38			Blui	ng Pin i	Rollout	
Perpe	ndicularity,	.001 i					, .		
	ongitudinal Gage Readir				<u> 21</u>	100/			
Capac	itance Gage	Reading			_ <i>\lambda</i>	10%		Same &	
Exit	Burr Height,	, in				• • • •	The state of the		
		<u>A</u>	ir Gage			l in.)			
,			Angul	lar Posi	tion	·			
	Axial	-0		220		2250	0.700	2150	
	Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1	6.0	6.0	6.0	6.0	5.0	5.0	6.0	
-	#2	4.0	2.0	6.0	7.0	7.0	8.0	3.0	
	#4	1.0	-1.0	1.0	5.0	-2.0	6.0	4.0	
L	#5	4,0	0	1.0	4.0	0	4.0	7.0	

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 8 Quality Variable Best Macratocs Specimen No. 2FSB No Interescence											
_ <b>&amp;</b> 	anufacturing O Cocca idle, rpm ting Fluid:	OFFICE STEE SIL	ee Ma	e CHA	yere.	ROVICE Extras LOGAS Tod. Rea	e de la companya dela companya dela companya dela companya de la companya de la companya de la companya dela companya de la companya de la companya de la companya dela comp	an A_			
Prot Perp L Flus Capa	Surface Finish, AA  Profrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse 10035  Flush dage Reading, in. 002  Capacitance Gage Reading 230  Exit Burr Height, in.										
	Air Gage Readings (,0001 in.) Angular Position										
	Axial Position	0.	45"	900	180°	17 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	270"	315"			
	801 tom #1 #2 #3 #4 #5	3.00	40	30	2.0	50 80 10 10	40	4 J 3.2 3.0			
Surface Finish, AA 35 Bluing Pin Rollout Protrusion, in. /23 Perpendicularity, .001 in./in. Longitudinal .cc 2 Transverse .cc 5 Flush Gage Reading, in. Capacitance Gage Reading 292 Exit Burr Height, in.											
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	00	45"	90°	1800	225"	270"	3150			
	Bottom #1 #2 #3	9.0 11.0 5.0 5.0	7.0	5 0 8 0 5 0 2.0	2.0 2.0 2.0 3.0	6.0 5.0 4.0 4.0	7.0	90			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 8 Quality Variable BEAL HOWTHING Specimen No. 3A4F MIN. INTERFERENCE										
Hole Manufacturing Conditions and Procedures: PROPULE STO HOLE  BORE EAST OFFICIE MAD GRANTER ENTRAVER WITH A  60° COUNTRESINE  Spindle, 1pm 660 Feed:										
Cutting Fluid: Depth: (Ind. Reading)										
Hole #1 Surface Finish, AA 30 Bluing Pin Rollout										
Protrusion, in.  Perpendicularity, .001 in./in.										
Longitudinal 19915 Transverse . OJR										
Flush Gage Reading, in. Capacitance Gage Reading										
Exit Burn Height, in.										
Air Gage Readings (,0001 in.)										
Angular Position Axial										
Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 2.0 3.0 5.0 8.0 70 70 40										
13 60 70 72 9.0 7.0 7.0 7.0 13 60 = 0 3.0 7.0 2.0 2.0 40										
40 -30 0 40 0 30										
Hole #2 Surface Finish, AA 🙎 🔭 Bluing Pin Rollout										
Protrusion, in. 174										
Perpendicularity, .001 in./in. Longitudinal .001 Transverse .001										
Flush Gage Reading, in										
Exit Burn Height, in.										
Air Gage Readings (.0001 in.) (2007)										
Axial										
Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 3.0 6.0 7.0 80 70 40 40										
13 40 20 60 50 20 50 20										
14 30 -4.0 1.0 4.0 4.0 4.0 2.0										
15 7.0 -2.0 0 3.0 -2.0 2.0 5.0										

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 8 Quality Variable BELLMOUTHING Specimen No. 1113B MAX. INTERFERENCE										
Hole Manufacturing Conditions and Procedures: PRODUCE 570. HOLE  BORE EXIT OF WOLE AND CHAMER FUTRANCE WITH A  60° COUNTER SINK  Spindle, rpm 660 Feed: ,0015 1PR  Cutting Fluid: Dey Depth: (Ind. Reading)										
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal  Capacitance Gage Reading Exit Burr Height, in.  Hole #1  Bluing Pin Rollout  Bluing Pin Rollout  ### ### ### ########################										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -3.0 -5.0 -7.0 -3.0 -7.0 -90 -4.0 #2 2.0 3.0 3.0 3.0 3.0 0 2.0 #3 2.0 5.0 5.0 4.0 2.0 4.0 0 #4 1.0 5.0 5.0 6.0 7.0 6.2 2.0 #5										
Hole #2  Surface Finish, AA  Protrusion, in. 14/3  Perpendicularity, .001 in./in.  Longitudinal 0015 Transverse .0015  Flush Gage Reading, in. 002  Capacitance Gage Reading 325  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 - 7.0 -5.0 - 9.0 - 4.0 - 4.0 - 8.0 - 8.0 #2 2.0 2.0 1.0 2.0 3.0 - 1.0 - 2.0 #3 6.0 6.0 5.0 4.0 5.0 3.0 1.0 #4 6.0 6.0 6.0 1.0 5.0 2.0 - 1.0 #5 — — 13.0 14.0 15.0 15.0										

MANUFACTURING REPORT: TAPERED HOLES										
Test Ser Specimen	ies <u>8</u> No. <u>284</u>		ity Vari	able <u>Z</u>		MAX.	G- UTERFEA	RENCE		
Hole Manufacturing Conditions and Procedures: PRODUCE STD. HOLE  BORE EXIT OF HOLE AND CHAMFER ENTRANCE WITH A  60° COUNTER SINK  Spindle, rpm 660 Feed: .0015 IPR  Cutting Fluid: DEY Depth: (Ind. Reading)										
Surface Finish, AA Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .002 Transverse .002 Flush Gage Reading, in. Capacitance Gage Reading 323 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180	225°	270°	315°		
	Bottom #1 #2	50	3,0	-5.0	-10.0	-9.0	-9.0	30		
-	#3	3.0	1:0	2.0	1	3	2.0	20		
	#4 #5	4.0	<u>e</u>	0	14.0	14.0	1.0	4.0		
	Hole #2 Surface Finish, AA 28 Bluing Pin Rollout Protrusion, in. 24/4									
Lor Flush (	dicularity, ngitudinal Gage Readin tance Gage	<u>o</u> g, in.	Transver	se , <u>00</u>		u Cil	pur!			
	ırr Height,			***		45%				
	Air Gage Readings (.0001 in.) Angular Position									
F	Axial Position	0°	45°	90°	180°	225°	270°	315°		
В	lottom #1	-6.0	-8.0	-11.0	-7.0	-8.0	- 8.0	70		
	#2	2.0	2.0	2.0	1.0	7.0	3.0	9		
	#4 #5	-/. 0	2	1.0	13.0	2.0	15.0			

MANUFACTURING REPORT: TAPERED HOLES									
Test Series 8 Specimen No. 156		ity Vari	iable 🕹		MAX. 1		erc e		
Hole Manufacturing Conditions and Procedures: PRODUCE STO. HOLE  BORE EXIT OF HOLE AND CHAMFER ENTRANCE WITH A  GOO COUNTER SINK  Spindle, rpm 660 Feed:									
Spindle, rpm 660 Feed: .oojs IPR Cutting Fluid: Der Depth: (Ind. Reading)									
Surface Finish, AA  Protrusion, in. , 239  Perpendicularity, .001 in./in.  Longitudinal pol Transverse pol  Flush Gage Reading, in									
Air Gage Readings (.0001 in.)  Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2 #3 #4 #5	-7.0 -1.0 2.0 3.5	-6.0 2.5 4.0 2.0	-9.0 1.0 3.5 3.0	-8.0 2.0 3.0 3.5 14.0	-6.0 3.5 5.0 5.0	1.0 3.0 3.0	-4.0 2.5 3.0 1.0		
			Hole #2						
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse .002  Flush Gage Reading, in002  Capacitance Gage Reading 294  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2	3.0	-8.0	-4.0	-40 40	-5.0 2.0	-5.0	-4.0		
#3 #4	7.0	1.5	4.5	6.0	3.0	5.0	2.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Sc Specimo	eries <u>8</u> en No. <u>266</u>	Qual	ity Vari	able 💆	BELLM	MAX. /	G- UTERFEA	ENCE		
<i>80</i> <u>60</u> Spin	nnufacturing <b>PRE EXIT D</b> <b>2° CO μυνία</b> ndle, rpm <u>6</u> ting Fluid:	FMOKE SINK 60	AND	GHAM	FER E	UTCAN	5rp. A E W/T (PR	H A		
Surface Finish, AA 80 Protrusion, in. 244 Perpendicularity, .001 in./in. Longitudinal 0005 Transverse 0025 Flush Gage Reading, in 001 Capacitance Gage Reading 300 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	#2 #3 #4 #5	2.0	3.0 4.0 5.0 4.0	-7.0 1.0 4.0 3.0	1.0 3.0 2.0	-4.0 110 5.0 2.0	-9.0 2.0 3.0 14.0	-3.0 4.0 5.0 40 15.0		
Surface Finish, AA 30 Protrusion, in										
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	#2 #3 #4 #5	6.0 1.0 2.0 3.0	4.0 4.0 4.0	-7.0 0 3.0 3.0	-5.0 2.0 2.0 1.0 15.0	5.0 3.0 3.0	7.0	4.0 4.0 4.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries 8 en No. 3c6	Qual	ity Var	iable <u>Z</u>	BELLM	MAX.		Ilve E		
Hole Manufacturing Conditions and Procedures: PRODUCE STD. HOLE  BORE EXIT DE HOLE AND CHAMFER ENTRANCE WITH A  60° COUNTER SINK  Spindle, rpm 660 Feed:										
Surface Finish, AA 40 Protrusion, in. ,239 Perpendicularity, .001 in./in. Longitudinal .0005 Transverse .00/ Flush Gage Reading, in										
Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	-4.0 2.0 4.0 4.0	-5.0 2.5 4.5 5.0	-8.0 -1.0 2.0 2.5	·3.5 4.5 4.5 3.0 14.0	-5.0 3.0 6.0 8.0	-8.0 -1.0 2.0 3.0	-5.0 1.0 1.0		
Surface Finish, AA Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .00/ Transverse .002 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 -4.0 -6.0 -5.0 -4.0 -6.0 -4.0 -6.0  #2 1.0 3.0 2.0 1.0 5.0 4.0 3.0  #3 2.0 4.0 3.0 2.0 6.0 5.0 7.0  #4 2.0 5.0 2.0 2.0 6.0 5.0 7.0									

	MANUFACTURING REPORT: TAPERED HOLES										
Test Sc Specime	eries <u>8</u> en No. <u>4824</u>	Qual	ity Vari	able 💆			G- UT& RF84	enc e			
. <b>20</b> - <b>60</b> Spin	nnufacturing <b>RE EXIT O</b> <b>COMMUTER</b> ndle, rpm 6 ing Fluid:	ENOGE Sink 60	AND	S. H. A.M.	ER E	UTRANS	570. A E W/T (1P8	H A			
Surface Finish, AA  Protrusion, in. 230  Perpendicularity, .001 in./in.  Longitudinal O Transverse .0015  Flush Gage Reading, in											
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	00	45°	90°	180°	225°	270°	315°			
	8ottom #1 #2 #3 #4 #5	2.0 2.0 2.0	60	3.0 3.0 2.0	1.0	1.0 3.0 0	-7.0 2.0 4.0 4.0	10.0 -2.0 2.0 2.0			
Proti Perpe l Flush Capac	Surface Finish, AA 35 Bluing Pin Rollout Protrusion, in. 244 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .002 Flush Gage Reading, in002 Capacitance Gage Reading S// S// S// S// S// S// S// S// S// S/										
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225"	270°	315°			
	Bottom #1 #2 #3 #4 #5	7.0 9.0 9.0 9.0 9.0 9.0 9.0	7.0	-10.0 -2.0 2.0 3.0	4.0 4.0 2.0 2.0	-8.0 3.0 6.0 6.0	-9.0 0 4.0 4.0	-5.0 2.0 2.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test S Specim	eries <u>8</u> en No. <u>303</u> /		ity Vari	iable 💆	BELLMO		G- UTERFEA	NEWC E		
	anufacturing  OF EXIT  OF COMMUTE  ndle, rpm  ting Fluid:	SINK 500	ons and	CHAM	res: F	UTRANG	EWIT	H A		
Surface Finish, AA Protrusion, in. Perpendicularity, .001 in./in. Longitudinal 00/ Transverse .00/ Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.  Hole #1 Bluing Pin Rollout Bluing Pin Rollout										
				Reading lar Posi		1 in.)		1 500		
	Axial . Position	00	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	3.0	-7.0	-5.0	-3.0	-10.0	-5.0	-7.0		
	#3	5.0	0	2.0	5.0	2.0	3.0	4.0		
	#5	2.0	13.0		3.0	3.0	3.0			
Surface Finish, AA 31 Bluing Pin Rollout Protrusion, in. ,239 Perpendicularity, .001 in./in. Longitudinal .002 Transverse .cc15 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.										
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	-8.0	-40	-6.0	-9.0 1.0	3.0	10.0	-5.0		
	#3	3.0	3.0	4.0	4.0	5.0	3.0	5.0		
	#5	7.0	1	-	4.0	14.0				

MANUFACTURING REPO	MANUFACTURING REPORT: TAPERED HOLES									
Test Series <u>8</u> Quality Varia Specimen No. <u>3C/T</u>	able 💆	BELLMO	MAX. L	G- UTERFEA	NEWC E					
Hole Manufacturing Conditions and F  BORE EXIT OF HOLE AND  60° COMMITTE SINK  Spindle, rpm 660  Cutting Fluid: DEF	CHAME	res: Pares Factorial Pares Fac	UTRANG	E WIT	H A					
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 31  Bottom #1 -3. U - 7.0 - 7.0 - 5.0 - 8.0 - 8.5 - 7.  #2 1. #3 3.0 1.0 3.0 3.0 0 2.  #3 1.0 4.5 1.0 3.5 4.0 0 3.										
#4 3.5 6.0 #5 — Ho	ole #2	3.0	4.0	14.0	3.0					
Surface Finish, AA 75 Bluing Pin Rollout Protrusion, in. 245 Perpendicularity, .001 in./in. Longitudinal <u>cc25</u> Transverse <u>.001</u> Flush Gage Reading, in. <u>.002</u> Capacitance Gage Reading <u>.290</u> Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45°	90°	180°	225°	270°	315°					
Bottom #1 -2.0 -8.0 #2 4.0 0 #3 2.0 3.0 #4 7.0 3.0	4.0 2.0 3.0	5.0 5.0 7.0 7.0	-9.5 2.5	-8:U 1.5 4.0 4.0	-30 40 40 40					

	MANUFACTURING REPORT: TAPERED HOLES								
Test Se Specime	eries 8 en No. 4847		ity Vari	able 💆	BELLMO	MAX. L	G- UTERFEA	ENC E	
Hole Manufacturing Conditions and Procedures: PRODUCE STO. HOLE  BORE EXIT OF HOLE AND CHAMPER ENTRANCE WITH A  60° COMMITTER SINK  Spindle, rpm 660 Feed: .0015 IPR  Cutting Fluid: Dey Depth: (Ind. Reading)									
Surface Finish, AA 70 Bluing Pin Rollout Protrusion, in. ,243 Perpendicularity, .001 in./in. Longitudinal 0 Transverse .002 Flush Gage Reading, in002 Capacitance Gage Reading .33/ Exit Burr Height, in.									
Air Gage Readings (.0001 in.), Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1 #2	4.0	-8.0	-5.0 2.5	-5.0	-7.0 2.0	-6.0	-6.0	
	#3 #4 #5	3.0 3.0 14.5	0	3.0	2.0	3.0 4.0 14.5	4.0	4.0	
Surface Finish, AA PO Bluing Pin Rollout Protrusion, in. 240 Perpendicularity, .001 in./in. Longitudinal .00/5 Transverse .00/ Flush Gage Reading, in. Capacitance Gage Reading 289 Exit Burr Height, in.									
Air Gage Readings (.0001 in.)									
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1 -3.0 -8.0 -7.0 -40 -10.0 -7.0 -8.0 #2 5.0 2.0 2.0 5.0 1.0 0 1.0 #3 6.0 40 0 5.0 1.0 0 3.0 #4 5.0 5.0 -1.0 3.0 3.0 1.0 2.0 #5 — — — — — — — — — — — — — — — — — — —								

MANUFACTURING BEPORT: TAPERED HOLES										
Test Series 8 Quality Variable BELLMOUTHING  Specimen No. 1047 Max. INTERFERENCE										
Hole Manufacturing Conditions and Procedures: PRODUCE STD. HOLE  BORE EXIT OF CLEE AND CHAMPER ENTRANCE WITH A  60° COMMTER SINK  Spindle, rpm 660 Feed: 0015 1PR  Cutting Fluid: Dey Depth: (Ind. Reading)										
Surface Finish, AA 30 Bluing Pin Rollout Protrusion, in										
Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position										
Axia1 Position	00	45°	90°	180°	225°	270°	315°			
Bottom #	-1.0	-3.5 2.5 3.0 1.0	-3.0 3.0 3.0 1.0	-6.0 -1.0 1.0 1.0	-4.0 2.0 3.0 2.0 13.0	-(.0 2.0 4.0 3.0 13.0	-4.0 3.0 6.0 5.0			
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal, 00/5 Transverse, 0005  Flush Gage Reading, in.  Capacitance Gage Reading  Exit Burr Height, in.										
Air Gage Readings (.0001 in.)										
Axial Position	0°	45°	90°	180°	225°	270°	315°			
Bottom #1 #2 #3 #4	0	8.0 1.0 2.0 2.0	7.0	8.0 20 3.0 140	4.0 4.0 4.0 2.0	-2.0 2.0 3.0 3.0	4.0 4.0 6.0 7.0			

INSPECTION SHEETS FOR TEST SERIES 9 - SURFACE ROUGHNESS

Test Se	ries 9	Quali	ty Varia	ible	Sicial	·	<u> </u>	25/5	3 mary
Tools: Spindle		11; 19/ 3 2	lowing 6 64 in. p	ollot dri	s: Tl; Group Feed: Depth	كالماعث	Drill R  / C  Reading)	ism	.D2040AR1-5
Surf Prot Perp Flus	s: Specimen face Finish, A rusion, in. pendicularity, Longitudinal th Gage Readin citance Gage Burr Height,	.001 l .001 l .004/mc .09. In. Reading in.	62 67 n./gage Jransve	length rse 2	ole #1	- -	Bluing	Pin Roll	out
		_		lar Posit		<del></del>			
	Axial Position	0,0	45"	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2	<del></del>	<u> </u>						
	74	+3	+2	+2	+2	±2	+2	4 3	7 7
•	#5	+ 0.5	4 : (	7 7	755	+0.5	10.5	10.5	0 3.5
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	.001 ii 203/ <i>ACI</i> g, in. Reading	72 n./gage Transve	length rse			Bluing	Pin Roll	out
		A		keadings Iar Posit	(.0001 in	<u>n.)</u>			
1	Axial Position	0°	45°	90°	135"	180°	225"	270"	315"
	Bottom #1								
	#2								
	#3	4:1	+!	+1	+ 1	+!-	+ 1	+	+   -
	#4 #5	10.5	+0.5	+0.5	10.5	1115	, 0 ,	- (, )	1 6 1 5

Test Se	eries <u>9</u>	Quali	ty Varia	ible	SURF	ACE R	206/11	1853 (6	3 um
	e Good Hole Us								
	#2 Centerdri		64 in. p	ilot dri					.D2040AR1-5
Spindle	e, rpm	325			Feed	: ////	-0.51	PM	
Cutting	g Fluid: TAZ	Min	c-AL	. ایم ن	Depth	n: (Ind.	Reading)	1.94	9
Surf Prot Perp Flus	s: Specimen face Finish, A trusion, in bendicularity, Longitudinal, th Gage Readin acitance Gage Burr Height,	.001 in	-65 / 175 n./gage VTransve	length rse .10. Q4- 68	101e #1  A ////CM  (.0001 i	- -	Bluing	Pin Roll	<u>out</u>
				ar Posit		<del></del>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2								1
	#3	OFFI							/
	#4	+0.5		+0.5	<u>q</u>	+0.5		0	0
	#5	0	0		1 + 1	+0.5	+0.5		<u> </u>
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 ir g, in. Reading:	./72 n./gage Transve	length rse .0.0		•	Bluing	Pin Rolle	out
		<u>A1</u>			(.0001 i	<u>n.)</u>			
1	Axial		Angu	ar Posit	ion	<u> </u>			<del></del> 1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2								
	#3								<del></del>
	#4	0	00	2	0	2	0	3	0
	#5	- 2	U	0	()				2

Test S	eries 9	Quali	ty Varia	ible	SINK	E Roc	GARTS	5 (63	uin)
Tools: Spindle		11; 19/	lowing ( 64 in. p	ollot dri	T1; Group Feed:	o 1, Omark : <u>HAND</u> n: (Ind.	-0 57	PM	D2040AR1-5
Surt Prot Perp Flus	s: Specimen face Finish, A trusion, in. pendicularity, Longitudinal, sh Gage Readin acitance Gage t Burr Height,	.001 l .001 l .001 l .001 l .002/wc. .001 l .001 l .001 l .001 l .001 l .001 l .002/wc. .003 l .003 l .004 l .005 l .006 l .007 l .007 l .008 l .0	/ <b>49</b> n./gage y Transve	length rse o		- - -	Bluing	Pin Roll	out
		2		ar Posit		<del>!!. /</del>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#3	41	+1	+1	#1	+1	+1	+1	±I_
	#5	0	0	0	3	0	9	3	2
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage I Burr Height,	.001 in <u>Pollices</u> g, in. Readings in.	1./gage Transver	length rse .c.:	3 /WCN	n.)	Bluing	Pin Rollo	out
1	[ A 2 A. 1		Angul	ar Posit	ion				
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2	13	+ 3	43	+ 3	+ 3	+ 3	+ 3	<del>+ 3</del>
ı	74	0	0	0	7 0	70	7 3	0	0
	15	0	٥	υ	0	0	0	0	

Test S	eries <u>9</u>	Quali	ty Varia	ble	SURFA	CE !	ROUSHA	VESS	(63 mm)
Tools: Spindle	e Good Hole Us #2 Centerdri e, rpm	11; 19/ 325	64 in. p	ollot dr	III; Group	o 1, Omark			.D2040AR1-5
Cutting	g Fluid: 57	ODDAR	D 50	LYENT	Depth	i: (Ind.	Reading)		50
Surt Prot Perp Flus	s: Specimen face Finish, A trusion, in. pendicularity, Longitudinal, sh Gage Readin acitance Gage t Burr Height,	.001 i .001 i g, in. Reading in.	74 n./gage Transve 	10. length erse .00 02 08		- - -	Bluing	Pin Roll	<u>out</u>
		<u>A</u>		Readings lar Posi	(.0001 i	<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2								
	#3	0					<del> </del>		
	#5	0	0	+0.5	1 0 L	+ 0.5	+0.5	+0.5	9
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	.001 io 302/2004 g, in. Reading in.	/ 7 0 n./gage Transve 	length rse	2	-	Bluing	Pin Roll	out
		A			(.0001 i	<u>n.)</u>			
	Axial			ar Posi		1	1	<u> </u>	
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1					<u> </u>	ļ		
•	#2		1.6	116	11/5	115	+ /	<del></del>	<del>                                     </del>
	#3	+1	+1.5	+1.5	+ 1.5	+1.5	0	7 0	+ /
	#5	0	0	0	a	+0.5	0	+0.5	40.5

Test Sc	eries 9	Quali	ty Varia	ible 5	Vii.			· (u	· u m
Tools: Spindle	Good Hole Us #2 Centerdr g, rpm g Fluid:	Sing Fol 111; 19/ 2/0	64 In. p	Condition	ITI; Group Feed	LAND	CDrlll Ro - 1.07 Reading)	PM	LD2040AR1-5)
Surf Prot Perp Flus	s: Speciments face Finish, Andrews In. Truston, In. Trust	, .001 1 .001 1 .001 / .000 .001 / .000 .000 / .000 / .000 .000 / .000 .000 / .000 .000 / .000 .000 / .000 / .000 .000 / .000 / .000 .000 / .000 / .000 / .000 .000 / .000 / .000 .000 / .00	5-62 5-4 n./gage Transve 	length rse .001	101e #1 2//// C.4 . (.0001 i	- - - - n.)	Bluing	Pin Rol	lout
1	Autol	<del> </del>	Angu	ar Posi	Lion	<u> </u>	7		
	Axial Position	0°	45°	90°	135°	180°	225°	270"	315°
	Bottom #1								
	#2						<del></del>		
1	#3								1
1	#4	1	+0.5	0	+0.5		+0.5	0	10.5
	#5	+0.5	11	10.5	1.1.	420	<u>+/</u>	0	+ /
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage ( Burr Height,	.001 Ir 001 Ir 00 I/MC g, 1n. Reading:	1 1./gage yTransve 	d:1- length rse . <u>00</u> 12 30			Bluing	Pin Roll	out
		<u>A1</u>			(.0001 i	<u> </u>			
Ī	Axial			ar Posit		S Companies and			
	Position	0°	45°	90°	135°	180°	225°	270°	315"
	Bottom #1 #2 #3		± 0.5	Q	+ 0.5	0	+ 0.5	0	1 0.5
	#5	2	100	0	4!	0	± /	3	
			لسلسة						<del></del>

lest S	eries <u>9</u>	Quali	ty Varia	ible	UPFR	CE A	Quit?	255 (	63um
ools: Spindle	#2 Centerdri e, rpm g Fluid:	sing Fol 111; 19/ 2/4 7.02/4	64 In. p	ondition ollot dri	Tl; Group Feed:	•	- 1.0 1	MA	
Surf Prof Perf Flus Capa	s: Specimer face Finish, A trusion, in. pendicularity, Longitudinal, th Gage Readin icitance Gage Burr Height,	001 lo. 001 lo	93 n./gage /Transve	length	ole #1	- - -	Bluing	Pin Roll	<u>out</u>
		A			(.0001 i	<u>n.)</u>			
	Axial		Angu	ar Posit	Ion	1	1	1	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1						<del></del>		
•	#2						Ì	<u> </u>	
	#3	-							
	#5	+ 2.4	+	10.5	+ -	+ 6.5	+1	1 0.5	15
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	.001 ir ool/wew g, in. Reading: in.	O/ n./gage Transve 	length rse . <u>co</u>			Bluing	Pin Roll	out
		<u>A1</u>		keadings ar Posit	(.0001 i	<u>n. /</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2		4						
	#3								
	#4	+1	0	+ 0.5	0	+ 0.5	10.5	10.5	10.5
	#5	+1	- 0	+0.5	0		+0.5	TVA	

Test S	eries 9	_ Qual	ity Varia	able S	UFFACE		51.WES	= (6	3 Mini
Tools: Spindle	#2 Centerdr e, rpm g Fluid: 57	111; 19/ 2/	64 in. p	oilot dri	T1; Group Feed		1.01	PM	
Surf Prof Perg Flus	s: Specimer face Finish, A trusion, in. pendicularity, Longitudinal, sh Gage Readir acitance Gage Burr Height,	.001 in. Reading	7 - 5 0 1 9 9 1 n./gage 1 Transve 0 0 1: 2	length rse .ooj 3	(.0001 i	- - - - - n.)	Bluing	Pin Roll	out
	Axial		Angu	ar Posit	tion	T	<del> </del>	<del>                                     </del>	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
•	#2								1
	#3								
	#4	0	+0.5	10.5	+0.5	+05	0	0	0
	#5	+!	1+1.	17.5	1+1	14 1.3		+ 0.5	
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 i oollwo g, in. Reading	n./gage yTransve	length rse .oo 3			Bluing	Pin Roll	out_
		<u>A</u>			(.0001 i	<u>n.)</u>			
11	Axial	<u> </u>	Angul	ar Posit	ion	<u> </u>		T	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2								
	#3								
	#4	0	-0	0	0	0	-0,	+ 0.5	+ 0.5
1.	#5	+/	+0.5	+0.5	+0.5	0	+/_	7 / 3	7-0.3

Test S	eries <u>9</u>	Quali	ty Varia	ble <u>S</u>	URFAC	= Rov	GHNE	55 (63	um.)
Tools: Spindle	e Goo.! Hole Us #2 Centerdri e, rpm g Fluid:	sing Fol 111; 19/ 2/0 18 4	lowing ( 64 in. p	Condition	Tl; Group	HAND	-1.01		
Pro: Per; Flus	s: Specimer face Finish, A trusion, in. pendicularity, Longitudinal sh Gage Readir acitance Gage t Burr Height,	.001 i .002/inc. ig, in. Reading in.	38 n./gage y Transve	length erse .002 02 266		-	Bluing	Pin Roll	out
		A		keadings lar Posit	(.0001 i	<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4	+0.5	+0.5	+ 0.5	+6.5	+ 0.5	+ 0.5	+ 0.5	+0.5
Prot Perp Flus	Face Finish, A crusion, in. pendicularity, Longitudinal, sh Gage Readin citance Gage burr Height,	.001 in. ook/wc/ g, in. Reading in.	r./gage yTransve :	length rse <u>.006</u>	le #2		Bluing	Pin Roll	out
		<u> </u>				,			
	Axial Position	0°	45°	ar Posi 90°	135°	180°	225°	270°	315°
•	Bottom #1 #2 #3		4.5	±/ =	+ /		+1		+ /.5
	#4		+1.5		70	+1	0	+10	3

Test S	erics <u>9</u>	Quali	ty Varia	ble	DURIA	CE R	DUSHN	1E55 (	(3mm)
Produc	e Good Hole Us	ing Fol	lowing (	Condition	ns:				
Tools:	#2 Centerdr	11; 19/	64 In. p	lot dr	III; Group	1, Omar	k Drill R	eamer (TL	D2040AR1-5
	e, rpm	210							
		ODDAR	o So	VEN+	Dept	: <i><u>Hedd</u></i> n: (Ind.	Reading)	1.95	0
Result	s: Specimen	No. 54	ESCT	Ī	lole #1				
	face Finish, A	IA <u>42</u>	-43L	in		wa-	Bluing	Pin Roll	out
	trusion, in.					-			
Per	pendicularity,				,				
	Longitudinal,	002/INC			2/INCH	-			
	sh Gage Readin				· · · · · · · · · · · · · · · · · · ·	_			
Capa	acit <mark>anc</mark> e Gage t Burr Height,	Reading	:	33.2		_			
LAI	t buil height,		ir Coop	Pandings	(.0001 i	- 1			
		<u>^</u>		ar Posi		<u>11. /</u>			
	Axial								
,	Position	0°	45°	90°	135°	180°	225°	270°	315°
			·	<u> </u>	<del> </del>	<del> </del>	<del> </del>	ļ	
	Bottom #1					ļ	ļ		
	#2			ļ	<b></b>	ļ			
	#3	<u> </u>			ļ				<b> </b>
	#4	2	_2_	2_	2	<u> </u>	<u>                                     </u>	0	0
	#3	0	0		0	0	<u> </u>		1 2
Prot	face Finish, A trusion, in pendicularity,			(4)	le #2		Bluing	Pin Roll	out
•	Longitudinal,				المصارم الميا	•			
Flus	sh Gage Readin	g, in.	.00						
Capa Exit	citance Gage   t Burr Height,	Reading: in.		262		•			
				Readings	(.0001 i	n.)			
	<del></del>		Angul	ar Posi	ion	<del></del>	Ţ		<del></del>
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1			· · · · · · · · · · · · · · · · · · ·					
	#2								
	#3								
	#4	0	+0.5	0	+0.5	0	+0.5	0	+ 0.5
	#5		+1.5	+1	+ 1.5	+1	+ 1	+ 1	+1

Test Series 9	Quali	ty Varia	able	DURFAC	E Rou.	SHOLE'S	5 (63 M	in.)
Produce Good Hole Us Tools: #2 Centerdr Spindle, rpm Cutting Fluid: TA	11; 19/	64 in. p	Condition Dilot dri	ns: T1; Group Feed Depti		Drill R		
IA.		15		ocpt.		neda mg/	7:33	<u></u>
Results: Specimer Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Readin Capacitance Gage Exit Burr Height,	.001 1	<i>55 −76</i> 1/6/ n./gage y Transve	length erse <u>rec</u>	<del></del>	7  - -	Bluing	Pin Roll	lout
	A		Readings lar Posit	(.0001 i	n.)			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1								
#2	+ 4	+ 4	+4	+4	+4	+4	14	-1 -4
74	0	٥	0	0	0	ی	0	0
#5		0		0	0	_ ن	<u> </u>	
Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal Flush Gage Readin Capacitance Gage Exit Burr Height,	.001 i g, in. Reading in.	<u>S  </u> n./gage Transve 	length rse		-	Bluing	Pin Roll	out
74	<u>A</u> _		Readings Lar Posit	(.0001 i	<u>n.)</u>			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1								
#2	1 5:	+ 2	125	+3	+3	+ 3	+3	13
#3	47		+2.5	13	10	0	3	0
//5	0	Ô	0	0	0	o	0	0

Test Se	ries 9	Quali	ty Varia	ible	SURFA	CE RO	VGHN	E35 (	(3Mil)
Tools: Spindle	Good Hole Us #2 Centerdri , rpm Fluid:	ing Fol 11; 19/ 2/0 0/4	64 in. p	ondition ollot dri	Tl; Group	HAN	0-1.07	eamer (TL	
Surf Prot Perp Flus	: Specimen ace Finish, A rusion, in endicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	.001 i .001 i .001 i .001 i .001 in. .001 in.	- 68 µ 40 n./gage Transve	length rse .00: 4	ole #1 2/1NC ~ (.0001 i	- - - - n.)	Bluing	Pin Roll	out
ľ	Axial		Angu	ar Posit	ion	ι	T	1	T
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1				<del> </del>		1		
Ī	#2								1
	#3								
ļ	#4	+ 1	+1	+ 1	+ 1.5	+ 1.5	+ 1	+/	+1
Į	#5		0_	0	0				
Proti Perpe l Flush	ace Finish, A rusion, in. endicularity, ongitudinal, n Gage Reading itance Gage ( Burr Height,	.001 ii 20 <i>3/wci</i> g, in.	1./gage (Transve	length	le #2		Bluing	Pin Roll	out
		A	r Gage	Readings	(.0001 i	<u>n.)</u>			
г	A: - 1		Angul	ar Posit	ion				
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
1	#2								
	#3					<del></del>			
	#4	+1	+!	+1	+1	+1.5	+ /	+	+ 1
L	#5	+ '	+1	+	+	7/.7			

Test Se	ries 9	Quali	ty Varia	ble _S	VREAC	E-RO	UGHA	1E 55	(63 min)
Tools: Spindle	#2 Centerdri e, rpm	ing Fol 111; 19/ 2 / O DR Y	lowing C 64 in. p	ondition ilot dri	Tl; Group Feed:	1, Omark <u>Hawo</u> : (ind.	-1.0I	PM	D2040AR1-5)
Prot Perp Flus	s: Speciment face Finish, A rusion, in. pendicularity, Longitudinal th Gage Readin citance Gage Burr Height,	.001 i .001 i .001 i .001 i .001 in.	72 /50 n./gage Transve 	length rse 0 3 27/ Readings	(.0001 i	- - - - - -	Bluing	Pin Roll	<u>out</u>
1	Axial	<del></del>	Angul	ar Posit	Ion	1	T	I	<del> </del>
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3	+1	+1	+1	+ /	+ /	+ 1	+1	+1
	15	0	0	0	0	0	0	0	0
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage ( Burr Height,	.001 ii 00//^t/ g, in. Reading in.	•/5/ n./gage Transve	length rse .003	le #2		Bluing	Pin Rolle	<u>out</u>
		<u></u>		ar Posit					
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
,	#2								
	#4	+1	#1,	+1	+1	+ 1	+1	+ /	11
		II	T	+1	7	<u> </u>	-+	<u> </u>	

Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5 Spindle, rpm
Results: Specimen No. 58908 . Hole #1  Surface Finish, AA 35-58
Surface Finish, AA 35-58 Lan Bluing Pin Rollout Protrusion, in. 160 Perpendicularity, .001 in./gage length Longitudinal 302/wc/Transverse .001/wc/ Flush Gage Reading, in003
Capacitance Gage Reading: 227 Exit Burr Height, in.
Air Gage Readings (.0001 in.) Angular Position
Axial Position 0° 45° 90° 135° 180° 225° 270° 3'5°
Bottom #1
12
#4 +1 +1 +1 +1 +1 +0.5 +1 +1
15 0 0 + 4.5 + 5.5 + 6 0 0
Surface Finish, AA 38-65 12 Bluing Pin Rollout Protrusion, in
Angular Position
Axial Position 0° 45° 90° 135° 180° 225° 270° 315°
Bottom #1
#2
#4 +1.5 + 1.5 + 1.5 + 1.5 + 1.5 + 1.5 + 1.5
15 + 1 + 2.5 + 1 + 1 + 1 + 1 + 1

Test Se	eries <u>9</u>	_ Quali	ty Varia	ble	SURFA	CE S	143-14	-57 (6	3 Mm.				
Tools: Spindle	#2 Centerdre, rpm	sing Fol 111; 19/ 2/0	lowing ( 64 in. p	Condition Dilot dr	IT1; Group	HEND		PM					
Prot Perp Flus Capa	s: Speciments face Finish, American, in Spendicularity Longitudinal, the Gage Reading Gage Burr Height,	.001 i .003/wew ig, in.	n./gage Transve	length rse ,004	Hole #1	- - - -	Bluing	Pin Roll	out				
Air Gage Readings (.0001 in.) Angular Position													
4	Axial Position 0° 45° 90° 135° 180° 225° 270° 315°												
Bottom #1 #2													
#3													
Surface Finish, AA 48-63 M LIL Bluing Pin Rollout Protrusion, in. 162 Perpendicularity, .001 in./gage length Longitudinal.002/MCL Transverse .002/MCC Flush Gage Reading, in003 Capacitance Gage Reading: 260 Exit Burr Height, in.													
Air Gage Readings (.0001 in.)  Angular Position													
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°				
	Bottom #1 #2												
	#3 #4 #5	+1	+ 0.5	+   +	+ 1 + 0.5	<del>i</del> 1 + 0.5	+ 0.5 + 0.5	<del>+</del>	+ 1 + 0.5				

Test Se	eries 9	Quali	ty Varia	ble	SURFA	CE RO	CG:NE.	- 5 (63	Min.)				
Produce	Good Hole Us	ing Fol	lowing C	ondition	s: Tie Groun	o 1 Omark	neill R	eamer (Ti	N2040AP1_5				
Spindle		2/0				HEND			.UZU4UAN1-5				
	Fluid:	DRY				n: (Ind.			19				
	•====	4		· · · · · · · · · · · · · · · · · · ·	•	•	,						
Results	: Specimer	No. 5	45E	. <u>H</u>	ole #1		21	A. A	-				
Surt	ace Finish, A	W	0-70	un		_	Bluing	Pin Roll	out				
	endicularity,		769	length		-							
1614	Longitudinal		Transve	rse 003	LINEH								
Flus	h Gage Readir	a. in.	.00		//NGA	-							
Capa	Capacitance Gage Reading: 297												
Exit	Exit Burr Height, in.												
	Air Gage Readings (.0001 in.) Angular Position												
Axial													
	Position 0° 45° 90° 135° 180° 225° 270° 315°												
									3.0				
	Bottom #1								}				
	#2					1			<del> </del>				
	#3	CHEN				f							
	/4	+1	+1	+1	41	+ /	+1	+/	+/				
	#5	0	0	0	0	0		0	0				
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	.001 i <i>Qc//.kcH</i> g, in. Reading in.	7.7 n./gage Transve  ir Gage	10 (1)  length rse .000 04 0304	(.0001 i		Bluing	Pin Roll	<u>out</u>				
	Axial		450	000	3050	1000	0050	0700	23.50				
	Position	0°	45°	90°	135°	180°	225°	270°	315°				
	Bottom #1												
	#2				<del></del>								
	#3						<u>-</u>	-					
	#4	0	0	100	0	+0.5	10.5	<del>0</del> † 0.5	10.5				
	#5	+0.5	+0.5	+0.5	+0.5	70.3	7 013	7 17.3	1819				

MANUFACTURING REPORT: TAPERED HOLES												
	Test Series 9 Quality Variable SURF ROUGHNESS-63 Specimen No. 4657											
Hole Ma	Hole Manufacturing Conditions and Procedures: 570 REHMER  GROUP I											
Spin Cutt	idle, rpm <u>6</u> ing Fluid:	60 Der			eed: epth: (	.00/S	ling)	1.255				
Surf	ace Finish, A		48	Hole ∦1		Blui	ng Pin	Rollout				
Perp L	rusion, in. endicularity, ongitudinal	i 100. T <b>100</b> .	ransver	se . 00	<u></u>							
Flush Gage Reading, in.  Capacitance Gage Reading  Exit Burr Height, in.												
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position 0° 45° 90° 180° 225° 270° 315°											
	Bottom #1 #2											
	#3											
75												
Surface Finish, AA 53 Bluing Pin Rollout Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .002 Transverse .002 Flush Gage Reading, in. Capacitance Gage Reading 253 Exit Burr Height, in.												
	Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2		*				_					
	#3											
	#5											

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES												
Test Se Specime	ries 9	Quali 8	ty Vari	able _	SURF	Rough	NESS .	-63				
	nufacturing ( Sroup Z					STD.	REAM	ER.				
	dle, rpm ing Fluid: _	660 Der			eed: epth: (I	.00/ nd. Read	ر ing) _	<u> </u>				
Prot Perp L Flus Capa	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal _oo/ Transverse O  Flush Gage Reading, inooz  Capacitance Gage Reading  Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1 #2												
#3												
	#5											
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .00/ Transverse .00/ Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.												
	Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2											
	#3											
	#5											

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES												
	eries 9 en No. 4D	Quali B	ty Vari	able _	SURF.	Rong	HNES	-63				
Hole Ma	nufacturing ( <u>GROUP</u> コ	Condition	ons and	Procedu	res:	STD.	PEA	MER				
	ndle, rpm ing Fluid:	660 De 1			eed: epth: (I	. <i>00</i> nd. Read		255				
Prot	face Finish, /		75.8	Hole #1		Blui	ng Pin	Rollout				
Perp L Flus	endicularity, ongitudinal. h Gage Readir	, .001 i <u>00/</u> T ng, in.	n./in. ransver: 	se. <u>000</u>	5							
Capacitance Gage Reading 225 Exit Burr Height, in.												
Air Gage Readings (.0001 in.) Angular Position												
1	Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1												
	#2											
	#4											
			<u></u>			ļ	<u> </u>					
Prot Perp	Surface Finish, AA 55-60 Bluing Pin Rollout Protrusion, in. 139 Perpendicularity, .001 in./in.											
Longitudinal O Transverse .00/ Flush Gage Reading, in00/ Capacitance Gage Reading 24/ Exit Burr Height, in.												
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1											
	#2											
	#4 #5											
	<u> </u>			<u></u>								

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES												
Test Se Specime	eries 9 en No. 4EZ	Quali T	ity Vari	able <u>S</u>	ure Ro	ushn <b>e</b> .	55 - 6	3				
	nufacturing ( GROUP		ons and	Procedu	res: <u> </u>	STD. A	REAMI	re				
Sp i r Cut t	ndle, rpm ing Fluid:	660 Der		F D	eed: epth: (I	.00/ nd. Read	S <sup>*</sup> ling) _	1,755				
Surf Prot	ace Finish, /	AA	65-	Hole #1		Blui	ng Pin	Rol lout				
L Flus	rusion, in. endicularity ongitudinal h Gage Readir	<u>0001</u> T	ransver	se <u>.00</u> 01								
Lapa	Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1												
#2												
	#4			1								
	#5			1								
Proti Perpo ( Flusi Capac	Surface Finish, AA 75-80 Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .002 Transverse 0 Flush Gage Reading, in. Capacitance Gage Reading 205 Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
!	Bottom #1		······································									
	#2				ļ							
	72											
	#5											

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES												
Test Se Specime	Test Series 9 Quality Variable Surf. Roughuss-63 Specimen No. 4018											
	Hole Manufacturing Conditions and Procedures: STD, REAMER GROWP I											
Sp I n Cutt	dle, rpm ing Fluid:	60 Dey			ed: epth: (I	O C	ling) /	227				
Prot Perp L Flus Capa	Surface Finish, AA 60-65 Protrusion, in. /30 Perpendicularity, .001 in./in. Longitudinal .00/ Transverse Flush Gage Reading, in											
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position 0° 45° 90° 180° 225° 270° 315°											
	Bottom #1 #2											
	#3											
	#5					<u> </u>						
Surface Finish, AA 65-25 Bluing Pin Rollout Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse 001  Flush Gage Reading, in002  Capacitance Gage Reading 215  Exit Burr Height, in.												
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2											
l L	#3											
	#4											

Figure 14 - Sample Manufacturing Report: Tapered Holes

Test Se	eries <u>9</u>	Quali	ty Varia	ible <u>5</u>	URFACE	E Ro	UGHNE	5 5. (3	2 m in.			
Tools: Spindle		11; 19/ 2.5	64 in. p	lot dri	TI; Group Feed:	HANI	-0.5	1PM				
cutting	Fluid: TAP	MAGK	FIR	ALUM.	Depth	i: (ina.	Reading)	1.95	<u></u>			
Surf Prot Perp Flus Capa	s: Speciment face Finish, A trusion, in. pendicularity, Longitudinal, sh Gage Readin citance Gage Burr Height,	.001 l .001 l .003/wc/ .003/wc/ .003/wc/ .003/wc/ .003/wc/ .001 l .003/wc/	0-38 83 n./gage Transve :3	length rse .oo 3		- - -	Bluing	Pin Roll	<u>out</u>			
	Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°			
	Bottom #1											
	#2											
	#3	+ 1.5	+1.5	+ 1.5	+1.5	41.5	41.5	+ 1.5	+ 1.5			
	#5	+ 0.5	+ 2.5	+0.5	+ 0.5	<u> </u>		3	0			
Prot Perp Flus	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	.001 in confunction g, in. Reading	, Transve 00 :3	length rse .oo 2 2		•	Bluing	Pin Roll	out			
	Air Gage Readings (.0001 in.)  Angular Position											
•	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°			
	Bottom #1											
	#2		4	1 1 =								
•	#3	+1.5	+1.5 0	+ 1.5	+1.5	+ 1.5	+1.2	+1.5	+1.5			
	#5	0	Ö	0	9	0	ڹ	<u></u>	0			

Surface Finish, AA  Perpendicularity, .001 in./gage length Longitudinal .001/m.c. Transverse .002/m.c.  Flush Gage Reading, in. Capacitance Gage Reading: Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position  Axial Position  Axial Position  Axial Position  Ay 1	m.)	2	55 (3	GHNE.	E Ro	SURFAC	ble	ty Varia	Quali	eries 9	Test Se			
Surface Finish, AA 15-18 According Protrusion, in.  Perpendicularity, .001 in./gage length  Longitudinal .001/r.cc Transverse .002/r.cc  Flush Gage Reading, in. 004  Capacitance Gage Reading: 358  Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 3  Bottom #1	40AR1-!		M	-0.51	HAND	Tl; Group Feed:	llot dri	64 in. p	11; 197 25	#2 Centerdri	Tools: Spindle			
Angular Position  Axial Position  0° 45° 90° 135° 180° 225° 270° 3  Bottom #1  #2  #3 42 12 +1 +1 +1 0 +0.5 +  #4 0 0 0 0 0 0  #5 11 :0.5 0 0 0 0 0  Bluing Pin Rollout  Protrusion, in. Perpendicularity, .001 in./gage length  Longitudinal .003/ncc/Transverse .002/ncc/ Flush Gage Reading, in. Capacitance Gage Reading: 390  Exit Burr Helght, in.  Angular Position		lou	Pin Rol	Bluing		/mss:	length rse oo 2	C 3 F 5 - /8 A n./gage Transve : 3	No. 4 .001 i .001///.ca g, in. Reading	s: Specimen face Finish, A rusion, in. endicularity, Longitudinal, ch Gage Readin	Results Surf Prot Perp Flus			
Axial   Position   0°   45°   90°   135°   180°   225°   270°   3	Angular Position													
#2 #3 +2 +2 +1 +1 +1 2 +0.5 + #4 0 0 0 0 0 0 0 #5 +1 :0.5 0 0 0 0 0  Bluing Pin Rollout  Protrusion, in. Perpendicularity, .001 in./gage length  Longitudinal.oos/www.Transverse .002/www. Flush Gage Reading, in. Capacitance Gage Reading: Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position	Axial Position 0° 45° 90° 135° 180° 225° 270° 315°													
Surface Finish, AA 14-18 Protrusion, in. Perpendicularity, .001 in./gage length Longitudinal.003/NCCTransverse .002/NCCC Flush Gage Reading, in. Capacitance Gage Reading: Exit Burr Height, in.  Angular Position  Axial		1								#2				
Surface Finish, AA 14-18 Protrusion, in. Perpendicularity, .001 in./gage length Longitudinal.003/NCCTransverse .002/NCCC Flush Gage Reading, in. Capacitance Gage Reading: Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position	0.5	1			+1	+1	+1_				i			
Surface Finish, AA 14-18 Bluing Pin Rollout Protrusion, in. Perpendicularity, .001 in./gage length Longitudinal.003/NCOTransverse .002/NCOT Flush Gage Reading, in. Capacitance Gage Reading: 390 Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position	<del>-  </del>	╬							21		1			
Angular Position Axial		lou	Pin Roll	Bluing	n. <u>)</u>	Ymcu	length rse .00 0 4-	n./gage Transver	.001 [1 203/1403 g, in. Reading:	rusion, in. endicularity, Longitudinal, h Gage Reading	Prot Perp			
						ion	ar Posit	Angul						
Position 0° 45° 90° 135° 180° 225° 270° 31	5°		270°	225°	180°	135°	90°	45°	0°					
Bottom #1		L												
#3 + 2 + 2.5 + 2 + 1 + 1.5 + 1.5 +	1.5	+-	+15	41.8	<del></del>	+2	+ 2	125	1 2		1			
14 0 0 0 0 0 0	0	1_									ł			
	≥.5	Iŧ												

Test S	est Series 9 Quality Variable SURFACE ROUSENESS (32 mm.)												
Tools: Spindle	#2 Centerdr #3 Centerdr #5, rpm #5 Fluid: #74	111; 19/ 2/0	lowing (64 in. p	ollot dri	T1; Group	HAND		PM	.D2040AR1-5)				
Surf Prot Perp Flus	s: Speciment Face Finish, A trusion, in. pendicularity, Longitudinal th Gage Readin toltance Gage Burr Height,	AA /8- , .001 I ng, in. Reading in.	n./gage Transve	length erse .00	(.0001 i	- - - - : n.)	<u>Bluing</u>	Pin Roll	out				
	Axial Position 0° 45° 90° 135° 180° 225° 270° 315°												
Bottom #1 #2													
/3													
15 +1 +1 +1 +1 +1 +1 +1													
Surface Finish, AA 18-32 M Bluing Pin Rollout Protrusion, in. 198 Perpendicularity, .001 in./gage length Longitudinal eliment Transverse 0 Flush Gage Reading, in003 Capacitance Gage Reading: 299 Exit Burr Height, in.													
Air Gage Readings (.0001 in.)  Angular Position													
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°				
	Bottom #1												
•	//2												
	#3	0	0	0	0	0	0	a	0				
	15	+0.5	+0.5	+	+,	+ 1	4	+1	+1				

Test Series 9	Quali	ty Varia	ible <u></u>	UNFAC	E Rou	GHNES	5 (32	Min.)			
		<b>64 in.</b> p	ilot dri		HAND	Drill R -0.5. Reading)	IPM				
Results: Specimer Surface Finish, Protrusion, in. Perpendicularity Longitudinal Flush Gage Readir Capacitance Gage	No. 5/AA /4 , .001 i . <u>ee //wc/</u> ng, in.	34 C B - 30 A 95 n./gage Transve	length	ole #1	- -		Pin Roll				
Exit Burr Height, in.											
Air Gage Readings (.0001 in.)  Angular Position											
Axial Position	Position 0° 45° 90° 135° 180° 225° 270° 315°										
Bottom #1											
#2											
14000000000											
#5 +1 +1 +1 +1 +1 +1 +1											
Surface Finish, AA 20-25 Bluing Pin Rollout Protrusion, in											
Flush Gage Reading, incc3 Capacitance Gage Reading: 292 Exit Burr Height, in.											
Exit Burr Height, in.  Air Gage Readings (.0001 in.)											
Angular Position											
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°			
Bottom #1											
#2											
#4	0	0	0		0	0	0	0			
#5	1	+	+	4.1	+1	+ 1	+	_+			

Test Se	eries <u>9</u>	Quali	ty Varia	ible	SURFAC	E Rou	CHNESS	(32 p	in.)			
Tools: Spindle		11; 19/ 25	lowing ( 64 in. p	ilot dri	Tl; Group Feed:	1, Omark HANG 1: (Ind.	-0.51	PM				
Prot Perp Flus	see Finish, A rusion, in. rendicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	.001 i .001 i .003/ncm g, in. Reading in.	2 - 38 /6 / n./gage Transve :	length erse 3		- - - - n.)	Bluing	Pin Roll	out			
Air Gage Readings (.0001 in.) Angular Position												
	Axial Position 0° 45° 90° 135° 180° 225° 270° 315°											
	Bottom #1											
	#2							<del> </del>	<del> </del>			
1	#3											
	#4	0	0	0	0	0	0	0	3			
	#5	0	0	0	0	0	0	0				
Prot Perp Flus	Surface Finish, AA 28-32 MM Bluing Pin Rollout Protrusion, in											
		A			(.0001 i	<u>n./</u>						
	Axial Position	0°	45°	ar Posit	I	180°	225°	270°	315°			
1	Bottom #1											
	#2											
1	#3	+1.	+1.	+1	+ /	+/	+1.	<b>+</b> /	4/			
1	#4	0	9	2	0	0	0	ن	0			
	#5	0	0	0	0	0	ے ا	ن	0			

Test S	eries <u>9</u>	Qual	ity Vari	able	SURE	ACE K	UUGHN	ESS (13	25 min.)	
Tools: Spindl	e Good Hole U  #2 Centerdr e, rpm	111; 19	llowing /64 in.	Conditio pilot dr	III; Grou	p 1, 0mar : <i>HANI</i> h: (Ind.	pers, z k Drili R D-LO IP, Reading)	E) eamer (TL  M 1.95	.D2040AR1-5)	
Tool: Spindle		0 Lt. 35 DRY 1 4 C	SPIK SSINK	AL PI	N REAL Feed Dept	ME K : <u>HAN</u> h: (Ind. SIZE I	Reading) <i>(EAMER</i>	1.21 THE	1 REAM	
Surf Prof Perf Flus	s: Speciments face Finish, Activities, Inc. of the Control of the	, .001 i <u>002/<i>NICH</i></u> ng, in.	70 n./gage Transve	length erse _ o	···	- - -	Bluing	Pin Roll	out	
Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	#2 #3 #4 #5	† <u> </u> + <u> </u> + <u> </u> + <u> </u>	+1.5	+ 1.5 + 1 + 1	+ 1.5 + 1.5	† 1.5 † <b>a.</b> 5		+ 2 + 1 + 2	+ 1.5 + 1 + 2.5	
Prot Perp Flus	ace Finish, A rusion, in endicularity, Longitudinal, h Gage Readin citance Gage	.001 id 601/14CB g, in.	Transve	length rse <u>oo</u> 3			Bluing	Pin Rollo	out	
		A		Readings ar Posit	(.0001 i	<u>1.)</u>				
•	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	Bottom #1									
•	#2 #3 #4	+ 3 .	±.3 10.5	±3.5	+ 3.5	+ +	‡ <del>4</del> † 1	+4+	+ 4	

Test Series 9	Qual	ity Varia	able	SUKE	ACE K	OUGHN	ESS (1	25 pm.)
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm S Cutting Fluid:	111; 19/	llowing ( 764 in. p	Condition Dilot dr	III; Grou	p 1, Omarl : <u>#A NO</u> h: (Ind.	Drill R Drill R Drill R Reading)	(E) Reamer (T M	LD2040AR1-5)
Modify Good Holes U Tool: Modifies Spindle, rpm Cutting Fluid: Procedure: Drice With FCE	DRY DRY Made	SINK.	AL PII	V REAL Feed Dept	MEX : <u>HAN</u> n: (Ind. SIZE A	EAMER	1, <b>2</b> 1HE	N KEAM
Results: Specimen Surface Finish, A Protrusion, in. Perpendicularity Longitudinal Flush Gage Readin Capacitance Gage		78 n./gage Transve	length rse .uc/	NOIE #1	- - -	Bluing	Pin Rol	lout
•	<u>A</u>		Readings ar Posit	(.0001 i	<u>n.)</u>			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
#2 #3 #4 #5	+0.5		+ 0.5	+ 0.5	+0.5	+ 0.5	+ 0.5	+ 0.5
Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Readin Capacitance Gage	.001 in 2/wch g, in.	Transver	M. An length rse .oo;			Bluing	Pin Roll	out
	<u>A</u>	ir Gage I Angul	Readings ar Posit	(.0001 i	<u>n.)</u>			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1. #2 #3 #4	÷ /	±.1.	.±.l.	+	+ 1	+1	+ 1 + 1	4 [

Test S	eries 9	Qual	ity Vari	able _	SURE	ACE K	OLGHN	ESS (	125 Mm.
Tools: Spindle		111; 19,	llowing ( /64 in. )	Conditio pilot dr	iil; Grou	p 1, 0mar : <i><u>!/A.//</u>!</i> h: (Ind.	k Drill F 	(E) Reamer (T (M)	'LD2040AR1-5
Tool: Spindle	rpm /	0 4/-/ 35 DRY 1 4 C	SINK	AL PI	N KEA Feed Dept	:	CEAMER	1.21 1HE	O NEAM
Surf Prot Perp Flus	s: Speciments face Finish, Andrews Finish, Andrews Finish, Andrews Finish, Andrews Finish Gage Reading Gage	, .001 i	<b>5-/50 73</b> n./gage Transve	length	dole #1	-	Bluing	Pin Rol	lout
		<u>A</u>		Readings lar_Posi	(.0001	n.)			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Rottom #1 . #2 . #3 . #4 . #5	0 %	eN	0 +1	0 + L	 	 	0 +1	, , +,
Prote Perpe I Flusi	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage	.001 in 02/NCH g, in.	n./gage Transve 	length rse .00	le #2		Bluing	Pin Roll	<u>out</u>
		<u>A</u> :	ir Gage I	Readings ar Posit	(.0001 i	n.)			
Ī	Axial Position	0°	45°	90%	135°	180°	225°	270°	315°
	Bottom #1	-							
	#2 #3 #4	+3	+3	4.3.5	4.3.5	+3.5	+3.5	+3,5	+ 3
	#5	0	41	40.5	11.5	+1		415	1 1

Test Series 9	Quali	ty Varia	ble	SURE	ACE K	UUGHNI	E35 (1	25 u in.)
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm S Cutting Fluid:	111; 19/	64 in. p	ilot dri	11; Group	o 1, Omark HANO 1: (Ind.	Drill R 	€) eamer (TI <u>1.95</u>	LD2040AR1-5)
Modify Good Holes U Tool: Modifies Spindle, rpm / Cutting Fluid: Procedure: Dell FEE	DRY L & C	SILR	AL PII	V REAL Feed: Depth	MER HANI I: (Ind. SIZE R USING	EAMER	1.25 THE	REAM
Results: Specime Surface Finish, Protrusion, in. Perpendicularity Longitudinal Flush Gage Readin Capacitance Gage	AA <u>8</u> ,200 , .001 i 000 ng, in.	n./gage Transve	length rse . 005	,	- - -	Bluing	Pin Roll	out
Axial Position Bottom #1 #2 #3	0°	45°	Readings ar Posit 90°	(.0001 i	180°	225°	270°	315°
Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal Flush Gage Readir Capacitance Gage	.001 ii	7./gage vTransvei . 003	length rse .co/	1e #2	<u>0</u> †!	Ð +/	o +/	out
Axial	<u> </u>	Angul	ar Posit			2250	2709	2150
Position  Bottom #1  #2  #3  #4	0°	45°	90°	135°	180°	225°	270°	315°

Test S	eries <u>9</u>	Qual	ity Vari	able	SURE	ACE K	UUGHN	E35 (	25 um.)
Spindle	e Good Hole U #2 Centerdr e, rpm ===================================	125	llowing /64 in.	Conditio pilot dr	ns: ill; Grou Feed Dept	p 1, 0mar : <u>Haw</u> h: (Ind.	persiz k Drill i D-LO IP Reading	re) Reamer (T <u>M</u>	'LD2040AR1-5)
Tool:	Good Holes U  Monifie  rpm	0 4.1	llowing (	Condition	ns: W KEM Feed	MER Had	0 - 3 I	°M	
Cutting Procedu	g Fluid: ure: <u>Druk</u>	DRY			UNDER	h: (Ind.	Reading) REAMEA	1.21 THE	N REAM
Surf Prot Perp Flus	s: Speciment face Finish, A crusion, in. pendicularity Longitudinal th Gage Readin acitance Gage	, .001 i	208 n./gage Transve	length erse <u>oo</u>		- - -	Bluing	Pin Rol	lout
		<u>A</u>		Readings lar_Posi	(.0001 i	n.)			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	#2 #3 #4 #5	+1+1+3.5	+ 0,5 + 1 + 3.5	±0,5 +3	+0.5	+ 0.5 + 0.5 + 3	+ 0.5 + 1 + 3.5	+ / + / + 3	+1+0.5+3.5
Prot Perpo Flusi	ace Finish, A rusion, in endicularity, Longitudinal, h Gage Readin citance Gage	.001 in co <i>s/wcr</i> g, in.	./95 n./gage Transve .063	length rse . <u>oo/</u>			Bluing	Pin Roll	<u>out</u>
		<u>A</u>	ir Gage I	Readings ar Posit	(.0001 i	n.)			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2					* ****	***************************************		
	#3 #4 #5	+0.5	+ 3	+ 0.5	+ 1 + 2.5	+ 0.5	+ 1	+ 1 + 3	+ 1 + 3.5

Test Series	9	Qual	ity Vari	able	SURE	ACE K	UVGHN	ESS (2	Square.
Produce Good Tools: #2 Co Spindle, rpm Cutting Fluid	3	sing Fo ill; 19/ 125 UKY	llowing ( 764 in. <sub>1</sub>	Condition of the condit	ns: Ill; Grou Feed Dept	p 1, Omari : <i><u>HA NO</u></i> h: (Ind.	Drill R Drill R A To Reading)	E) leamer (T  // 94	LD2040AR1-5)
Modify Good P Tool: Me Spindle, rpm Cutting Fluid Procedure:	01 F1 E1 1: Drie	DRY MODE	SILK	ML PI	V KEAL Feed Dept	: <u> </u>	Reading) REAMER		NEAM
Results: S Surface Fi Protrusion Perpendicu Longit Flush Gage Capacitano	nish, / o, in. ularity, udinal Readir	.001 i .003/wc	n./gage yTransve	length erse .001	Hole #1	- - -	Bluing	Pin Rol	lout
	al tion om #1 #2 #3 #4 #5	0°	45°	Readings ar Posit 90°	135°	180°  + 1 + 2.5	225°  + 1 + 1 + 25	270°  + 1 + 1 + 2	315°
Surface Fi Protrusion Perpendicu Longit Flush Gage Capacitanc	, in larity, udinal Readin	.001 ii	1./gage Transve	length rse	1e #2		Bluing	Pin Roll	out
		A		Readings ar Posit	(.0001 i	n.)			
Ax i		0°	45°	90°	135°	180°	225°	270°	315°
Bott	om #1	± 1.5 + 0.5 + 3.5	+1	±.1 +0.5 +3.5	+ 1.5 + 0.5 + 3.5	+ /	±1 ±1 +3,5	+ 1 + 3	+1.5 +1 +3

Test Series	_9_	Qual	ity Vari	able _	SURE	ACE K	UUGHN	ESS (2	50 m	)
Produce Good Tools: #2 Co Spindle, rpm Cutting Fluid		sing Fo ill; 19 325 DRY	llowing ( /64 in. p	Conditio pilot dr	ns: ill; Grou Feed Dept	p 1, 0mar : <i>Ha NU</i> h: (Ind.	persize k Drill F Pading)	(E) Reamer (1	TLD2040AR	-5) - -
Modify Good H										
Tool: Mo	DIFIE	0 4-1	. SPIK	AL PI						-
Spindle, rpm Cutting Fluid						HAN				-
Procedure:	": <u> </u>	DRY				h: (Ind.			0	<b>-</b> .
-	DELE	<u> </u>	NOWK	WITH	UNDER	5/2E /	KEAMER	J.H.	A KEAA	1
-	FEE		I E IE D	PIN	KEAME	K USIN	C MA	EKAIF	MAND	•
-	T. C.	· U		<del></del>						•
_										•
Results: S					tcle #1					
Surface Fi				80 K	in	_	Bluing	Pin Rol	lout	
Protrusion				·		_				
Perpendicu	larity	, .001 i	n./gage	length	,					
Longit	udinal	001/MCA	Iransve	rse .00	5/INCH	_				
Flush Gage	Keadii	ng, in.	· · · · ·	<u> </u>	<u> </u>	-				
Capac i tanc	e Gage	Reading	· _/8	4		_				
		А	ir Gage	Readings	(.0001 i	n.)				
		<u></u>		ar_Posi						
Axi	a l					<u> </u>			1	7
Posi	tion	0°	45°	90°	135°	180°	225°	270°	315°	
<del> </del>			<del></del>	<del> </del>				- <del> </del> -		$\dashv$
Bott	om #1				_	_				
	#2	l liai .								
	#3	±3_	4 3	+ 3	1.4.3	+.2.5.	+ 3	+ 3.5	+3.5	_
<del> </del>	#4	+ 1.5	174	1+2	- - <del>t.</del> 2	+ 4.5	4 1.5	+ 1.5	+ 1.5	4
l	#5	<u>.  +   _ </u>	11	1+1	17 1	1 + 1	L+ +	1405	7 4 1	_
				Иa	le #2					
Surface Fig	nich A	Δ 2 3	2 0 2 7				Bluing	Pin Roll	out	
Protrusion				0 24 2	7	•	bruing			
Perpendicu				length		•				
			Transve		LINCH					
Flush Gage	Readin	g, in.		01						
Capaci tance										
		A	ir Gage I	Readings	(.0001 i	<u>n.)</u>				
·			Angul	ar Posit	ion	<del>,</del>	·		Ţ	-1
Axia		0°	45°	90°	135°	180°	225°	270°	315°	
Posit	ion	U	43	30	135	100	223	2/0	313	
Botto	m #1									
1- BULTS	#2								1	1
1	#3	+ 2	+ 2.5	.t. 3	1.4	+4	+45	+ 5	+4	1
	#4	+15	+ 2	+2	+ 2	12	+ 2	+2	+ 1.5	1
	#5	+ 3	+ 1	+0.5	+ 0.5	+ 1	+/	+ /	+0.5	

Test Series 9 Quality Variable SURFACE ROUGHNESS (250 min.)										
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325 Feed: HAND-LOIPM  Cutting Fluid: Dky Depth: (Ind. Reading) 1.949										
Modify Good Holes Using Following Conditions:  Tool: Modified LH SIKAL PIN REAMEN  Spindle, rpm 135 Feed: HAND - 3 ICM  Cutting Fluid: DRY Depth: (Ind. Reading) 1590  Procedure: Drill & Co'SINK WITH INDERSIZE REAMER THEN NEAM  WITH MODIFIED PIN REAMER USING MONTRAIE HAND  FEED										
Results: Specimen No. 4E2B Hole #1  Surface Finish, AA 250-300 Bluing Pin Rollout  Protrusion, in203  Perpendicularity, .001 in./gage length  Longitudinal.002/wcw.Transverse .002/wcw  Flush Gage Reading, in004  Capacitance Gage Reading: 190										
Air Gage Readings (.0001 in.)										
Angular Position  Axial Position  0° 45° 90° 135° 180° 225° 270° 315°  Bottom #1  #2  #3  #4  +1  #4  +1  #5  #4  +35  +3  +2  +2  +2  +2  +3  +4  +2										
Surface Finish, AA 260-280 M Bluing Pin Rollout Protrusion, In. ,200 Perpendicularity, .001 in./gage length Longitudinal, 03/MCUTransverse .002/MCU Flush Gage Reading, in. ,004 Capacitance Gage Reading: 197										
Air Gage Readings (.0001 in.)										
Angular Position										
Axial Position 0° 45° 90° 135° 180° 225° 270° 315°										
Bottom #1										

Test S	erles <u>9</u>	Qual	ity Vari	able	SURE	ACE X	0 (	E33 (2	Sound)
Spirale	e Good Hole t  #2 Centerdi e, rpm g Fluid:	Ising Fo 111; 19 32.5 DRY	llowing ( /64 In. (	Conditio pilot dr	ns: III; Grou Feed Dept	p 1, 0mar : <u>//a///</u> h: (Ind.	Reading)	Reamer (T	LD2040AR1-5)
Tool: Spindle	g Fluid: uro: <u>Drit</u>	0 L/35 DRY L 4 (	SINK	AL PA	V REA Fred Dopt	: //el.a/ h: (Ind.		<b></b>	a Aldal
Surf Prot Perp Flus	s: Specime face Finish, trusion, in, pendicularity Longitudinal th Gage Readi acitance Gage	, .001 .001/wc ng, in.	<del>10 - 2 هـ ۱/ څ /</del> In./gage ير Transve	length erseo			Bluing	Pin Rol	lout
	Axial Position  Bottom #1  #2  #3  #4	0° + 2.		90°  † 2.5.  + 2.5.	(.0001   135°   135°   + 2 + 0.5 + 1	180°	225° + 7.5 + 0.5	270° 1 2 1 2.5 1 2.5 1 2.5	315°
Prot Perpe     Flust	ace Finish, A rusion, in. endicularity Longitudinal, h Gage Readir citance Gage	.001 l .001 l .002/wc	n./gage yTransve .∶∪	length			Bluing	Pin Roll	out
•	NAMES IS A SECURE SEC.	<u>A</u>		Readings ar Posit	(.0001 I	n.)		ay turnagana sah - anana	
	Axial Position	0°	45°	90°	135°	180°	225°	270"	315°
	Bottom #1 #2 #3 #4	† 1.5 †	+1.5	10.5	1 2	+1.5	+ 2	+ 2	+ 2.5

Test Series 9 Quality Variable SURFACE ROUGHNESS (250 pm.)	
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-Spindle, rpm 325  Cutting Fluid: Dky Depth: (Ind. Reading) 1.950	5)
Modify Good Holes Using Following Conditions:  Tool: McDified LH Stikal PIN REAMER  Spindle, rpm 135 Feed: HAND-3IPM  Cutting Fluid: DRY Depth: (Ind. Reading) 1.570  Procedure: DEILL & COSINK WITH UNDERSIZE REAMER THEN REAM  WITH MEDIFIED PIN REAMER USING MODERATE HAND  FEED	
Results: Specimen No. 3838 Hole #1  Surface Finish, AA 140-200 Mem Bluing Pin Rollout  Protrusion, in. 192  Perpendicularity, .001 in./gage length  Longitudinal .ee/mcm Transverse 0/0/wcu  Flush Gage Reading, in002  Capacitance Gage Reading: 199	
Air Gage Readings (.0001 in.)	
Axial Angular Position	ĺ
Position 0° 45° 90° 135° 180° 225° 270° 315°	İ
Bottom #1	
#3 + 0.5 + 0.5 + 1 + 1 + 1 0 + 1 + 1.5 + 1	
Surface Finish, AA /40-200 kem Bluing Pin Rollout Protrusion, in. /90 Perpendicularity, .001 in./gage length Longitudinal pol/wch Transverse .0/8/WCH	
Flush Gage Reading, in. 004 Capacitance Gage Reading: 190	
capacitance days nouding.	
Air Gage Readings (.0001 in.) Angular Position	
Axial Position 0° 45° 90° 135° 180° 225° 270° 315°	
Bottom #1	
#3 +1 +1 +1 +1 +1 0 0	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	

Test S	eries <u>9</u>	Qual	ity Vari	able	SURE	ACE K	DUCHA	E35 (2	250 pm.)
Tools: Spindle	e Good Hole U  #2 Centerdr e, rpm 3 g Fluid:	sing Fo 111; 19 125 DKY	llowing /64 in. (	Condition pilot dr	III; Grou Feed	p 1, 0mar : <u><i>HANI</i></u> h: (Ind.	10 IP	M	
Tool: Spindle	Fluid:	DKY MGD	SINK	AL PI	V KEAL Feed Dept	: ///// //h: (Ind.	REAMEA	1.59	NE AM
Surf Prot Perp Flus	s: Specimer face Finish, A rusion, in. endicularity, Longitudinal th Gage Readir ecitance Gage	.001 .002/m .003/m	50-21 220 n./gage yTransve	length rse .003		- - -	Bluing	Pin Rol	lout
		A	ir Gage_	Readings	(.0001	n.)			
	Axial Position	0°	45°	ar_Posi	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4	± 2 + 1 + 0.5	+ 2 + 1	+ Z + 0.5 + 1	+ 2 + 0.5 + 0.5	+ 2 + 0.5 + 1	† Z † 0.5 † ]	1 2 + 0.5 + 0.5	† 2 † 0.5 † 0.5
Prot Perpe	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage	.001 i 001/in/2 g, in.	Transve	length rse <u>O</u>	le #2		Bluing	Pin Roll	out
		<u>A</u>	ir Gage I	Readings	(.0001 i	n.)			
	Axial Position	0°	Angu I	ar Posit 90°	135°	180°	225°	270°	315°
j	Bottom #1 #2 #3	4 [	<b>+</b> 1	±./_	+.1	+ 1.5	+1.5.	412	+ 1
	#4 #5	4 3	+ 1	+1+2.5	+ 1 + 2.5	+ 2.5	1 2	+1+2	4 1.5

Test Series 9 Qua	lity Variab	le	SURFA	ACE K	O V G HA	ESS (2	sex me)		
Produce Good Hole Using F Tools: #2 Centerdrill; 1 Spindle, rpm 325 Cutting Fluid: DRY	ollowing Co 9/64 in. pi	ndition lot dr	ill; Group Feed:	עט ( Omari	-10 TP	M	·		
Modify Good Holes Using Formation: Modify Good Holes Using Formation Color Formation From 135 Cutting Fluid: DRY Procedure: Dell's FEED	L SUKA! Co'SINK	WITH	V REAL Feed: Depth			_1. <b>59</b>	REAM		
Results: Specimen No. 5 Surface Finish, AA Protrusion, in. Perpendicularity, .001 Longitudinal Flush Gage Reading, in. Capacitance Gage Reading	20-260 .2/d in./gage le 	ength		- - -	Bluing	Pin Roll	out		
Air Gage Readings (.0001 in.)									
Axial	Angular	Posit	on	1	·	1	1		
Position 0°	45°	90°	135°	180°	225°	270°	315°		
Bottom #1	_								
#2 #3 #4 #5 #5	+ 4	1.5	1 1	+ 1	+ 1 + 0.5 + 3	+ 1	+1 +1 +3		
		Un'	10 #2			· · · · · · · · · · · · · · · · · · ·			
Surface Finish, AA	240-280		le #2		Bluing	Pin Rolle	out		
Protrusion, in	2/0	nath							
Longitudinal ,002/mc			3/INCH						
Flush Gage Reading, in. Capacitance Gage Reading	.002								
tapaci tance dage nedam	·								
	Nir Gage Rea			)					
Axial	Angular	Posit	ion						
Position 0°	45°	90°	135°	180°	225°	270°	315°		
Bottom #1									
#2									
#3 +1	+1 +	-0.5	+1	+ 0.5	+0.5	+05	+ 0.5		
#5 +4	1+4 1	3,5	+ 3.5	13	+ 3	+ 3	13		

Test Series 9	Qualit	y Vari	able	SURE	ACE K	UUGHN	E22 (3	souin)
Produce Good Hole Us Tools: #2 Centerdri Spindle, rpm 3 Cutting Fluid:	11; 19/6 25	owing (	Condition pilot dr	III; Grou Feed	p 1, 0marl : <u> </u>	-10 IP.	M	
Modify Good Holes Us  Tool: Modified  Spindle, rpm  Cutting Fluid:  Procedure: Drice  WITH  FEE	LH. 35 DRY 4 Co' Madre	SINK	AL PII	V REAL Feed Dept	MEK : <u>IAAA</u> h: (Ind. SIZE A	EAMER	1.59	V KEAM
Results: Specimen Surface Finish, Ad Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Reading Capacitance Gage	.001 in.	/gage ransve	length erse	lole #1	- - -	<u>Bluing</u>	Pin Roll	out
Axial Position Rottom #1 #2 #3 #4	0° +/.5 + / 4 2.5		90°	(.0001 i	180°	225°  + 2 + / + 2.5	27.0°	315°
Surface Finish, AA Protrusion, in. Perpendicularity, Longitudinal, A Flush Gage Reading Capacitance Gage R	. 242 .001 in. . 3/wc# T , in.	/gage	length rse . <u>00 2</u>			Bluing	Pin Rolle	out
	Air		Readings ar Posit	(.0001 i	<u>n.)</u>			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1 #2 #3 #4 #5	+0.5	+ 0.5 0.5	±65	+ 1,5	+ 1	<u> </u>	0 + 0.5	0

Test Seri	les <u>9</u>	Qual	ity Varia	able	SURE	ACE K	OUGHN	ES 5 (2	50 mm.
Tools:	rpm 3	111; 19.	/64 In.	pilot dr	ill; Grou Feed	p 1, Omarl : <i>HANC</i> h: (Ind.	-10 TP	M	LD2040AR1-5)
Tool:	: Drie	2 L.F.	SINK	AL PI	V KEA Feed Depti	: //A A/	REAMER	_/. <b>59</b>	NEAM
Surfac Protru Perpen Lo Flush	Specimer e Finish, A sion, in. dicularity, ngitudinal, Gage Readin tance Gage	.001 i .001/wch	200-2 6 n./gage Transve	length erse ,00		- - -	Bluing	Pin Rol	lout
		Δ	ir Gage	Readings	(.0001 i	n.)			
	Axial Position	0°		90°		180°	225°	270°	315°
	#2 #3 #4 #5	+ / + / + 4	+ 1.5 + 1.5 + 3.5	+ 4.5 + 0.5 + 3	± L	+ / + 0.5 + 3	+0.5	+ 1 + 0.5 + 3	+ 2.5
Protrus Perpend Lor Flush (	e Finish, A sion, in. dicularity, ngitudinal, Gage Readin tance Gage	.001 io 2/war g, in.	n./gage Transve	length rse .co2			Bluing	Pin Roll	<u>out</u>
		<u>A</u>	ir Gage I Angul	Readings ar Posit	(.0001 i	n.)			
P	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Nottom #1 #2 #3 #4	+1	+ 0.5	+ I + 0.5	t. I	+ 1	+1	+ 1 + 0.5	+ 0.5
	#5	113	13	1. 25	1 2 5	4 2.5	1125	1 1 5	1 1 5

Test Series 9 Quality Variable SURFACE ROUGHNESS (250 min.)										
Tools: Spindle	e Good Hole U #2 Centerdr e, rpm = 5 g Fluid:	sing Fo 111; 19, 125 DRY	llowing ( /64 in. p	Condition pilot dr	ill; Group	o 1, Omar : <u>Hawi</u> i: (Ind.				
Tool: Spindle		DRY DRY Made	SINK	AL PII WITH		#A A. 1: (Ind.			NEAM	
Surf Prot Perp Flus	s: Speciment ace Finish, A rusion, in. pendicularity Longitudinal, the Gage Readinal citance Gage	AA 2 , 2/ , .001 i ee <del>4</del> /wc/	90-30 0 n./gage yTransve	length rse .eo:	,		Bluing	Pin Rol	lout	
	Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	Bottom #1 . #2 . #3 . #4 . #5	+ 2.5	+ 1 + 1 + 2.5	+ 0.5 + 1 + 2.5	+ L + 2.5 + 2	+ / + 2.5 + 2.5	+ 1 + 2 + 2		11 + 2 + 2.5	
Prot Perpe Flus	Surface Finish, AA 240-300 Mm Bluing Pin Rollout Protrusion, in. ,220 Perpendicularity, .001 in./gage length Longitudinal 202/200 Transverse .006/2004 Flush Gage Reading, in004 Capacitance Gage Reading: 234									
		Al	r Gage F	Readings	(.0001 in	<u>)</u>				
	Axial Position	0°	Angul 45°	ar Posit 90°	135°	180°	225°	270°	315°	
	Bottom #1 #2 #3 #4	+3.2 +3 +0.2	+0.5 +3.5 + 2	Q + 2.5 1 4	+0.5 +2 +3.5	+ 3 + 4	0 +3 +4	+3+4	1 ; 2,5 7 3,5	

INSPECTION SHEETS FOR TEST SERIES 10 - RIFLING

Test S	ieries 10	Qual	ity Vari	able _	RIFLI	NG			
Tools: Spindl	e Good Hole U  #2 Centerdr e, rpm 32 g Fluid: 57	111; 19	/64 in.	pilot dr	ill; Grou Feed	p 1, 0mar : <i>HANI</i> h: (Ind.			
Tool: Spindle	ure: REAL	DRY MG MER I	OOD.	#67 HOLE YOLE	Feed Dept THE	PIN REA : HAN h: (Ind. N TH UT RO	<u>)</u> Reading) <i>RuST</i>	TAPEN	PIN
Sur! Pro!	s: Speciment face Finish, Atrusion, in. pendicularity	AA <u>46</u>	9-50 A 83 n./gage	length	Hole #1	<u></u>	Bluing	Pin Roll	out + +
Capa	Longitudinal, sh Gage Readir acitance Gage th of Rifle, i	ng,'in. Reading	: <u>3</u>	86	4/INCH	- - -	70	%	
		<u>A</u>			(.0001 i	<u>n.)</u>			,
	Axial	1	Angu.l	la <u>r Posi</u> i	t jon			i	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4 #5	0 +0.5 +1.5	0 + 0.5 + 1.5	 + <i>I</i> + <i>I</i> .5	0_1.0.5	10.5	0 _0_	0 + 0.5 + 4.5	0 + 0.5 + 1,5
					le #2		_7 12	22 T2	
Surf	ace Finish, A rusion, in.	A <u>35</u> •19	-45	un	·	•	Bluing	Pin Rolle	out L
Perp Flus Capa	endicularity, Longitudinal, h Gage Readin citance Gage ( h of Rifle, i	.001 i <i>002/wc/</i> g, in. Reading	n./gage yTransve 	rse .001	HINCH		Ç	70%	*
осрс					/ 0001 :-	· - \			1
		A	ir Gage i Angul	ar Posit	(.0001 ii	1.7			1
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2#3	I							
-	#4	0	0	0	0		0	+0.5	0
	#5	0	0	0	0	0	0	0	0

Test Series 10 Quality Vari	able	RIFLI	NG			-
Produce Good Hole Using Following Tools: #2 Centerdrill; 19/64 in. Spindle, rpm 325 Cutting Fluid: STOONAND Sc	pilot dri		o I, Omari E <i>E(ANE</i> n: (Ind.	Reading	eamer (II <i>1.</i> 95	LD2040AR1-5)
Hodify Good Holes Using Following Tool: MCDIFIED 2 FLOTE Spindle, rpm Cutting Fluid: DRY Procedure: REAM GOOD REAMER INTO DEEP AFTER	#C TA	PER P Feed: Depth THE	### 1: (Ind. 1/1 THE	0 Reading) CLST	TAPEK	1101
Results: Specimen No. 5 5 7 Surface Finish, AA 55-65 11 Protrusion, in. 185 Perpendicularity, .001 in./gage Longitudinal .collectTransver Flush Gage Reading, In. Capacitance Gage Reading: 25 Depth of Rifle, in	length erse <u>oo</u>	le #1			Pin Roll 70%	out ↓ ↓
	Readings		1.)			
Axial Position 0° 45°	90°	135°	180°	225°	270°	315°
#2 #3 #4 0 0	0	0	0	0	0	00
Surface Finish, AA 55-70 µ Protrusion, in/86 Perpendicularity, .001 in./gage	length			Bluing	Pin Rollo	<u>ut</u> ↓ ↓
Longitudinal <u>on face Transve</u> Flush Gage Reading, inoc  Capacitance Sage Reading: 3  Depth of Rifle, in	3 /	/wen		809	75	
Air Gage	Readings (	.0001 in	<u>.)</u>			
Axial Position 0° 45°	ar Positic 90°	135°	180°	225°	270°	315°
#2 #3			(A. A.			
#1 0 0 #5 +1 +1	+/	0	- !\ 	2	0 -	+1

Test Series 10 Quali	ty Variable	RIFE	NG		·····	
Produce Good Hole Using Foll Tools: #2 Centerdrill; 19/6 Spindle, rpm 325 Cutting Fluid: StophAd	64 in. pilot	drill; Grou	up 1, 0mar d: <i>HAM</i> ch: (Ind.	0-0.5	EPM	
Modify Good Holes Using Foll Tool: Manifiel 2 Foll Spindle, rpm Cutting Fluid: DRY Procedure: REAM GO REAMER IN DEEP AFTE	LUTE #C	TAPER Feed Dept  F THE	h: HAN h: (Ind.	<u>)</u> Reading) <i>CUST</i>	TAPER	e rint
Results: Specimen No. 2 ( Surface Finish, AA 25- Protrusion, in. 18 Perpendicularity, .001 in Longitudinal 002/mrs	/gage lengt Transverse.o		_ _	Bluing	Pin Rol	lout 1
Flush Gage Reading, in. Capacitance Gage Reading: Depth of Rifle, in.	381 .004		- - -		90%	,
Aiı	r Gage Readir	ngs (.0001 i	in.)			1
	Angular_Po					
Axial Position 0°	45° 90°	135°	180°	225°	270°	315°
Bottom #1 #2						
#3 #4 #5	0 0	00	0	0	0	0
		Hole #2		n) !	D' - D-11	
Surface Finish, AA 29-35 Protrusion, in/8				Bluing	Pin Roll	but L L
Perpendicularity, .001 in.			•			
Longitudinal, colling T	ransverse .o			0.0	~	1
Flush Gage Reading, in. Capacitance Gage Reading:	<u>.003</u> 372	<del> </del>		909	0	
Depth of Rifle, in.	.004		•			1
	Gage Readin	os ( 0001 i	n			
Air	Angular Pos		11. /			1
Axial Position On	45° 90°	135°	180°	225°	270°	315°
7031(101)		- 155				
Bottom #1						
#2						
#4 0	0 0	0	0		0	0
#5 0	0 0	0	0	0	0	0

Test Series 10	Qua	ity Vari	able	RIFLI	NG			
Produce Good Hole Tools: #2 Centerd Spindle, rpm 3 Cutting Fluid: 5	rill; 19	/64 in.	pilot dr	iil; Grou Feed	p 1, 0mar : <u> </u>	2-0.5	PM	
	DRY MER	PLUTE POD WTO 1	#G 7	APER Feed Dept THE	: AAN. h: (Ind.	<u>)</u> Reading) & <i>UST</i>	TAPER	R PIN
Results: Specime Surface Finish, Protrusion, in. Perpendicularity Longitudinal Flush Gage Readi Capacitance Gage Depth of Rifle,	, .001 <u>000</u> ng, in. Reading	/8 2 in./gage _ Transve 	length erse .000	Almen	-		Pin Rol	lout
bepen of mire,		ir Gage	Readings	(.0001 i	n.)			ļ
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1 #2 #3 #4	0	0 0	00	000	0,0	0	0	0 0
Surface Finish, A	./	93	~	le #2		Bluing	Pin Roll	out
Perpendicularity Longitudinal, Flush Gage Readin Capacitance Gage Depth of Rifle,	002/mc/ ig, in. Reading	Transve	rse . <u>002</u>	//NCN		80	%	;
	<u>A</u>		Readings ar Posit	(.0001 in	n.)			,
Axial Position	0°	45°	90°	135°	180°	2_5°	270°	315°
Bottom #1 #2 #3 #4	0	0	- 0		0	0	0	0
15	0	0	0	0	0	0	0	

Test S	ieries <u>10</u>	_ Qua	ity Vari	lable _	RIFL	NG			
Tools: Spindl	#2 Centerdre, rpm 32 g Fluid: 57	111; 19	/64 in.	pilot dr	Feed	up 1, Omai d: <u>#Aw</u> th: (Ind.			
	Good Holes U								
Tool:	MODIFIE	1) 2	FLUTE	#67	TA PER	PIN REA	MER-	LH. 5P	KAL
	e, rpm	2	<del></del>		heed	h: HAN	Pooding		<del></del>
	g Fluid:								4 42 /
		MER	WTO	HOLE TOUCH	WITHU	N I N	TATIA	1APE 1 6 .40	0500"
Sur Pro	s: Specimer face Finish, A trusion, in. pendicularity,	A 18-	67 n./gage	length	Hole #1	 	Bluing	pin Rol	lout
	Longitudinal				4/WCH	_	7	0%	· ka
Flus	sh Gage Readir	ng, in.		01_	<u> </u>	_	•	- 10	,
Dent	citance Gage th of Rifle, i	Reading	و :	65		-			į
оері	in or kille, i	···	.00	2 4	·	-			į.
			ir Gage	Readings	(.0001	<u>in.)</u>			
		,	Angu	lar Posi	t jon				
	Axial	1	1				2050		
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2				· <del></del>	-	-		<del>- </del>
	: #3				-				
	#4	0	0	0	0	_Q	0	0	0
	#5	0	10	10	10	1 0	10	0	
Prot	ace Finish, A rusion, in		181	•	le #2		Bluing	Pin Rol	lout
	endicularity,								- 1
	Longitudinal.		_						į.
	h Gage Reading		. <u>00</u>			•	2	30%	į
•	citance Gage	_				•			<b>,</b>
Dept	h of Rifle, i	··	.004			•			1
		<u>A</u>	ir Gage	Readings	(.0001 i	<u>n.)</u>			Į.
			Angul	ar Posit	ion	,		<del></del>	,
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
1	#2								
-	<u>#3</u> #4								1
ł	15	0	0	0	0	0	0	0	0

Test Series <u>10</u>	Qual	ity Vari	able	RIFLI	NG			
Produce Good Hole Tools: #2 Centerd Spindle, rpm 3 Cutting Fluid: 5	rill; 19 2.5	/64 in.	Conditio pilot dr	ill; Grou Feed	p 1, 0mar l: <u> </u>	0-0.5	EMM	-
Procedure: REA	DRY OM G	COD OOD WTO A	#G T	APER Feed Dept THE	: HAN h: (Ind. N TH	Reading)	TAPEK	2 1101
Results: Specime Surface Finish, Protrusion, in. Perpendicularity Longitudinal Flush Gage Readi Capacitance Gage Depth of Rifle,	, .001 i .001/wc ng, in. Reading	774 n./gage yTransve 	length erse oo	ole #1	- - -	<del></del>	Pin Roll	lout
bepth of krite,		ir Gage	Readings lar Posit	(.0001 i	<u>n.)</u>	-		
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1 #2 #3 #4	0	0 0	0	0	. 0	0	<u>a</u>	0 0
Surface Finish, Protrusion, in.	17	2	u m	le #2		Bluing	Pin Rolle	out
Perpendicularity Longitudinal Flush Gage Readir Capacitance Gage Depth of Rifle,	ool/wcH ng, in. Reading:	Transver	rse . <u>003</u> 3	VINCH.		ć	90%,	i.
	Ai	r Gage f	Readings ar Posit	(.0001 i	<u>n.)</u>			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1						. are \$6 Marie \$40.00 to		
#4 #4 #5	0	0	0	0	0	0	0	0

Test Series 10	2 Qua	lity Var	lable _	RIFL	ING				
Produce Good Hole Tools: #2 Center Spindle, rpm 3 Cutting Fluid:	drill; 1: 25	9/64 in.	Condition pilot do	rill; Gro			Reamer (* <i>[PM</i>		
Procedure: REA	ED 2 ORY AM G MER	FLUTE COD INTO	HOLE	Feed Dept	d: <u>HAA</u> Lh: (Ind.	(A) Reading (RL'ST	TAPER	rid	
Results: Specim Surface Finish, Protrusion, in. Perpendicularit Longitudina Flush Gage Read Capacitance Gag Depth of Rifle,	AA 40 y, .001 1.001/10 ing, in. e Readin	-60 // 8 3 in./gage // Transv	length erse <u>.00</u> 0 3	Hole #1	  	Bluing	j Pin Rol 709		
Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°									
Bottom #1 #2 #3 #1	0	0	0		. 0	0	0.0	0	
Surface Finish, Protrusion, in. Perpendicularity Longitudinal	, .001	30	length	ole #2		Bluing	Pin Roll	out	
Flush Gage Readi Capacitance Gage Depth of Rifle,	Reading in.	· <u>· · · · · · · · · · · · · · · · · · </u>	3 92 94	(.0001)	- - n.)		<i>80%</i>		
Axial Position	0°	Angul 45°	ar Posit	135°	180°	225°	270°	315^	
Bottom_#1_ #2_ #3 #4	0	0	0	0	0	0	8	0	

Test Serie	s <u>10</u>	_ Qual	ity Vari	able	KIELL	NG	······		
Produce Go Tools: #2 Spindle, r Cutting Fl	Centerdr	111; 19 5	/64 in.	pilot dr	ill; Grou	p 1, Omar : <u>HAN</u> h: (Ind.			(LD2040AR1-5)
Modify Good Tool: <u>M</u> Spindle, r Cutting Flu Procedure:	ONIFIE DM C Lid: REAN REAN	DRY MERI	OOD NTO A	#6 T	Feed Feed Dept	:	<u>Þ</u> Reading) <i>KUST</i>	TAPER	e rin
Protrusi Perpendi Long Flush Ga Capacita	Finish, A on, in cularity, itudinal ge Readin nce Gage	.001 i .001 i .002/m g, In. Reading	174 n./gage Transve .00	length erse <u>oo</u>	2/NCH	-		Pin Rol	lout
A	Rifle, i		ir Gage	Readings ar Posit 90°	(.0001 i	n.) 180°	225°	270°	315°
Во	#2 #3 #4	0	0	ن	2	0	0	0	٥
Protrusion Perpendion Long Flush Gag	Finish, AA on, in. cularity, itudinal ge Reading	./7 .001 ir 000 1, in.	./gage Transvei •€0 ∑	n length rse <u>o</u> o	le #2			Pin Roll	out
Depth of	nce Gage R Rifle, in	۰	00 <b>4</b> r Gage F		(.0001 ir	<u>n.)</u>	,		ļ.
Pos	ition  tom #1  #2  #3	0°	45°	90°	135°	180°	225°	270°	315°
	#4 #5	0	0	0	3	0	0	0	0

Test Series 10	Qua	lity Vari	iable _	RIFLI	NG		<del> </del>	
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm 32 Cutting Fluid: 57	111; 19 15	1/64 in.	pilot dr	rill; Grou Feed	p 1, Oma : <u>Haw</u> h: (Ind	0-0.5	IPM	
REAL	1) 2 DRY M G MER	PLUTE OOD WTO	#6 7	Feed Dept	: HAN h: (Ind.	Reading  **Reading**  **RUST**	TAPEN	R PIN
Results: Specimer Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Readin Capacitance Gage Depth of Rifle, i	.001 .001 .03/NC .03/NC .03/NC .03/NC	30 // 5 in./gage y Transve 	length erse <u>,00</u>	Hole #1	-		Pin Rol	lout
		ir Gage		s (.0001 i	<u>n.)</u>		a- • • • • • • • • • • • • • • • • • • •	!
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1 #2 #3 #4 #5	0	0	0	0	0		0 0	0 0
Surface Finish, A/Protrusion, in. Perpendicularity, Longitudinal, Flush Gage Reading	.001 i 003/mc/ 3, in.	<b>73</b> n./gage µTransve <u>•0</u> 0	length rse .00	le #2			Pin Roll	out
Capacitance Gage F Depth of Rifle, in	٦	ir Gage	Readings	(.0001_ir	)			2
Axial	<u> </u>	Angul	ar Posit	ion	<u> </u>	2050	0700	2350
Position Bottom #!	0°	45°	90°	135°	180°	225°	270°	315°
#2 #3 #4 #5	0	0	0	0	0	0	0	0

Test Series/	Qua	lity Vari	able _	RIFLI	NG			
Produce Good Hole Tools: #2 Center Spindle, rpm Cutting Fluid:	drill; 1:	9/64 in.	pilot dr	ill; Grou Feed			Reamer (1 [PM]	
RED	DRY AM G	FLUTE OOD INTO 1	#67 HOLE YULE	Feed Dept THE	: HAN h: (Ind.	Reading	TAPER	e rin
Results: Special Surface Finish Protrusion, in Perpendicularia Longitudina Flush Gage Read Capacitance Gag Depth of Rifle,	AA <u>25</u> ty, .001 el .003/wo ding, in. ge Reading, in.	77/ in./gage y Transve 	length erse <u>.00</u> 2		- -		Pin Rol	lout
Axial Position Bottom #1	0°		Readings lar Posi	135°	180°	225°	270°	315°
# 2 # 3 # 4 # 5	- 0	0	0	0	0	0	0	0
Surface Finish, Protrusion, in. Perpendicularit Longitudina Flush Gage Read Capacitance Gage Depth of Rifle,	y, .001 i 1 <u>.002////</u> ing, in. e Reading	175 n./gage yTransvei	length	le #2		Bluing 70	Pin Roll	out 🔸 🕴
		ir Gage F	Readings ar Posit	(.0001 in	n.)			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1 #2 #3 #4	0	0	0	0	0	0	0	0

INSPECTION SHEETS FOR TEST SERIES 11 - AXIAL SCRATCHES

Test Series	Qual	ity Vari	able _	SCRATO	HES -	ANIAL		
Produce Good Hole Us Tools: #2 Centerdri Spindle, rpm	11; 19 5	/64 in.	pilot dr	ill; Grou Feed	p 1, 0mar : <u>#Ann</u> h: (Ind.	-0.5	PM	
Procedure: READ	BERIA RY 1 GO	CD HO	R WITH	Feed Dept	: <u>//a//</u> h: (Ind. NSERT	) Reading) BOKING WGULAR	BAR I	
Results: Specimen Surface Finish, A Protrusion, in. Perpendicularity,	A 3	9-55 173	un	Hole #1	-	Bluing	Pin Rol	lout L
Longitudinal of Flush Gage Reading Capacitance Gage Depth of Scratch,	9, in. Reading	y Transve	o 2 359	Juck _	- - -	80	%	<i>[</i> ! ∵
	A	ir Gage	Readings	(.0001 i	n.)			i
			lar_Posi				<del></del>	-i
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1	B 19 No.	-						
#2#3			-		***********			-
#4	00	0	0	C	0	0	0	0
Surface Finish, AA Protrusion, in. Perpendicularity,	./	69	length			Bluing	Pin Roll	out
Longitudinal 2 Flush Gage Reading Capacitance Gage R Depth of Scratch,	in. eading	Transve	rse <u>105</u>	//NCM		S	000	
beptil of seraten,	_	.00			•			
	<u>A</u>	r Gage Angul	Readings ar Posit	(.0001 i	<u>n.)</u>			
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
Bottom #1 #2								
#3				1: 1				
#4	0	90	0	0	0	0	0	0

Test S	Series	_ Qual	ity Vari	able _	SCRATO	HE5 -	AXIAL		
Tools: Spindl	ce Good Hole U  #2 Centerdr  le, rpm 32  ng Fluid: 57	ill; 19 5	/64 in.	pilot dr	III; Grou Feed	p 1, Omar : <i>HAND</i> h: (Ind.	-0.5	PM	-
Tool: Spindl	e, rpm O	BeRI DRY M GO T BO	NG BA	LE ,T	Feed Dept	: <u>Haw</u> h: (Ind. VSERT VECK A	) Reading) BokinG NGULAK	BAR I	IND TOUCH CH AND SHT OUT
Sur Pro	s: Specimer face Finish, A trusion, in. pendicularity,	AA	5-38 168 n./gage	length	Hole #1	-	Bluing	Pin Rol	lout
Capa	Longitudinal, sh Gage Readin acitance Gage th of Scratch,	ng, in. Reading	: <u></u>	902	I / INCH	- - -	80	%	
		A	ir Gage	Readings	(.0001 i	n.)			
	Axial	1	Angu.	lar_Posi	t.jon		<del></del>	<del></del>	<del></del> -
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1				-				
	#3				-				
	#4	0	0	_6_	0		0	0	2
	#5	1_0_				10	10	1_0_	10
	face Finish, A		5-50 170		le #2		Bluing	Pin Roll	out
Perp Flus Capa	pendicularity, Longitudinal, th Gage Readin citance Gage ( th of Scratch,	.001 i <i>pol/jnch</i> g, in. Reading	n./gage Transve	rse . <u>001</u>	INCH		9	070	!
	,	_							1
		<u>A</u>	ir Gage Angul	Readings ar Posit		<u>n.)</u>			1
,	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2		ļ						<del>  </del>
•	#4	0	0	0	0	_0_	0	C	
	#5	0	0	0	2	.7	0	10	0

Test S	Series	_ Qual	ity Vari	iable	SCRATE	CHES -	AZIAL		<del></del>
Tools: Spindl	e Good Hole U #2 Centerdr e, rpm 32 g Fluid: 57	111; 19	/64 In.	pilot dr	·III; Grou	p 1, Omar : <u> </u>			
Tool: Spindl Cuttin	ure: <u>REA</u>	BCRU DRY M GO T BO	NG BA	K WIT	Feed Dept	: <u>Han</u> h: (Ind. NSERT HECK A	Reading BOXING	BAR A	
Sur Pro Per Flus Capa	s: Specimer face Finish, A trusion, in. pendicularity, Longitudinal, sh Gage Readin acitance Gage th of Scratch	.001 .001//w ng, in. Reading , in.		length erse.001 01 379	s (.0001	- - - - -	Bluing	Pin Roll	<u>lout</u>
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	#2 #3 #4	0 0	0	0	000	0	0	0 0	٥
Prot Perp Flus Capa	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage I h of Scratch,	.001 i 01/ACA g, in. Reading	77 n./gage Transve	length rse . <u>oo</u>	le #2	• • •	Bluing	Pin Roll 70%	out
		<u>A</u>	ir Gage Angul	Readings ar Posit	(.0001 i	n.)			,
•	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
•	Bottom #1 #2 #3 #4	0			0 + /	0	0	0	0
	#5		+0.5	1 <u>T_</u> L_		1405	+0.5	40.5	

Test Ser	ies <u>//</u>	_ Qual	ity Vari	able _	SCRATO	HES -	AXIAL	<del></del>	
Tools: / Spindle,	Good Hole Usual Contendry 12 Centerdry 32 Ce	111; 19 <i>.</i> <i>5</i>	/64 in.	pilot dr	III; Grou Feed	p 1, Omarl :	-0.51	PM	LD2040AR1-5
	luid: בי <u>REA</u> ע עף א	BERIA DRY M GO	OD HO	LE ,T	reed Depti	i <u>HAWI</u> n: (Ind. VSERT J	) Reading) BORING NGULAR	BAR A	IND TOUCH ON AND SHI OUT
Surfac Protru Perpen Lo	Speciments Finish, Assion, in	.17 .001 i	<b>2-42</b> ∕ n./gage yTransve	length erse .00	dole #1			Pin Rol	lout
Capaci	tance Gage of Scratch,	Reading in	ir Gage	05	(.0001 i	n.)	80	276	į.
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	#2 #3 #4 #5	0	0	0	0	_0_	0	0	0 0
Protrus	e Finish, A/ sion, in. dicularity,		170	Man	le #2		Bluing	Pin Roll	out (.
Lor Flush ( Capacit	ngitudinal a Gage Reading tance Gage F of Scratch,	02/INCH in. Reading	Transve .00;	rse .004	Y/NCH		8	0%	
		A	r Gage   Angul	Readings ar Posit	(.0001 i	<u>ı.)</u>			•
F	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2								
	#3 #4		0	0	0	0	0	0	0
	#5	0	0		L 0	0	0		Q

Test Ser	ries <u>//</u>	_ Qual	ity Vari	able	SCRATO	HES -	AXIAL		· ·
Tools: Spindle.	Good Hole U #2 Centerdr rpm 32 Fluid: 57	111; 19. 5	/64 in.	pilot dr	ill; Group	o 1, Omar : <u>#A<i>ND</i></u> h: (Ind.			
Tool: Spindle, Cutting	SPECIAL rpm O Fluid: e: REAL MOVE	Beria DRY M GO	OD HO	LE T	Feed Depth	HAND 1: (Ind. VSERT MECK A	) Reading) Boking NGULAR	BAR A	NO TOUCH
Surfa Protri Perpei Lo	Specimen ce Finish, A usion, in. ndicularity, ongitudinal Gage Readin	.001 i	0-50 /72 n./gage /Transve	length		• •	Bluing	Pin Roll 90%	
Capac	itance Gage	Reading	: _36	2	·	•		/ 6/2	<b>&gt;</b>
Depth	of Scratch,	in	.0	05	<del></del>	-			i
		<u>A</u>		Readings lar_Posid	(.0001 i	<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2								
-	#3#4	0	0	0	0	_0	0	0	
Ļ.	#5	1 <u>0</u>	I <i>O</i>	<u> </u>		<u> </u>	0_	! <u>e</u>	
	e Finish, A/	4	0-50		le #2		Bluing	Pin Roll	out
Perpen Lo Flush Capaci	ndicularity, ongitudinal <u>¿</u> Gage Reading tance Gage F of Scratch,	.001 in. 103/200 1, in. Reading:	Transve	length rse <u>.001</u> 02 73	INCH		E	30%	
		Ai	r Gage	Readings	(.0001 in	<u>ı.)</u>			
	Axial Position	0°	Angul 45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
-	#2	of a summer of the							
1	#4	0	0	<u></u>	0	0	0	0	0
1	#5	0	0	0	0 1	0	0	0	0

Test S	series	_ Qual	ity Vari	able _	SCRATO	HES -	AXIAL		
Tools: Spindl	e Good Hole U #2 Centerdr e, rpm32 g Fluid:	ill; 19 <i>5</i>	/64 in.	pilot dr	III; Grou		k Drill f - 2,5 ( Reading)		
Tool: Spindle Cutting	ure: REAL	Beria DRY M GG T BO	OD HO	LE TOFHE	Feed Dept	: <u>Han</u> h: (Ind. NSERT YECK A	u Reading) Boking MGULAR	BAR B	
Sur I Prot Perp	s: Specimer face Finish, A trusion, in. pendicularity, Longitudinal	.001 i	7-45 17/ n./gage Transve	length erse .002	lole #1	- -	Bluing	Pin Rol	lout
Capa	sh Gage Readin acitance Gage th of Scratch,	ıg, in. Reading	: 37	02		- - -	•	90%	<u>.</u> !
		<u>A</u>			(.0001 i	<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3								
	#5	0	0	0	0	0	0	0	0
Prot Perp Flus Capa	ace Finish, Arrusion, in. endicularity, Longitudinal, h Gage Reading citance Gage F	.001 i 002/WCA g, in. Reading	68 n./gage Transve	length rse ,003	1e #2 //WCH			Pin Roll	out
		<u>A</u>		Readings ar Posit	(.0001 ir	<u>ı.)</u>			ł
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	#2 #3 #4	0	0		0	0	0	0	0
-		¥	<u> </u>	X			L		

Test S	eries <u>//</u>	Qual	ity Vari	able _	SCRATO	HES -	AXIAL		
Tools: Spindle	e Good Hole Us #2 Centerdri e, rpm 32. g Fluid: 57	111; 19, 5	/64 in.	pilot dr	ill; Grou Feed	p 1, 0mar : <u> </u>	-0.51	PM	
Modify	Good Holes Us	ing Fol	lowing	Condition	ns:				
Tool:	SPECIAL	BeRIA	IG BA	C WITH	7 60°	SHALL PO	INTED	INSERT	-
2biuaie	e, rpm				reed	HAND	)		
Procedu	Fluid:	DRY	00 44	10 7	uepti	h: (Ind.	Keading)	040	A'W TOWA
	UP AT	T ROT	TOM (	DE HOL	E C	VSERI A	WGULAR	POSITI	CH AND
	MOVE	RAL	MALL	1.005	THE	W RE	RACT	STRAK	SHT OUT
Prot Perp	s: Specimen ace Finish, A rusion, in. pendicularity,	.001	7/ n./gage	length	iole #1	<b>-</b> -	Bluing	Pin Rol	lout
Flus	Longitudinal.q h Gage Readin	004 / nc	y i ransve		JACH	-		a . #4	\$ 11.50
	citance Gage			75		-	/	70%	1
	th of Scratch,					_			1
		_	: - Cana	Dondines	( 0001 :	- - \			·
		^		ar Posit	(.0001 i	11.7			
	Axial	1						Ī	
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	B-44 #1		1	<del> </del>	-			-	1
	<u>Bottom #1</u> #2			·			·	- <del></del>	<del> </del>
	#3								
	#4	0	0	0		_0_	0	0	ي
	#5	<u> </u>	10	<u> </u>	<u>e</u>	1 0	0		10
Surf	ace Finish, AA rusion, in.	3.	<u>s - 45</u>		le #2		Bluing	Pin Roll	out
Perp	endicularity,	.001 ir	1./gage	length		i			•
1	Longitudinal 🏽	02/NCH	Transve	: <u>٥٥</u> ، rse	NOH				•
	h Gage Reading		00				80	5%	Ĺ
	citance Gage R h of Scratch,			62					l l
ОСРС	,					•			
		Ai	r Gage I	Readings	(.0001 i	n.)			
,	Pallantagian de la pantatatatanse e	<u> </u>	Angul	ar Posit	ion	<del>,                                      </del>			<del>,</del>
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
1	Bottom #1								
1	#2			<del> </del>					<del> </del>
1	#4	0	0	0	0	0	0	0	0
1	//5	0	0	0	0	0	Q	0	

Test S	eries _//	_ Qual	ity Vari	able _	SCRATO	CHES -	AXIAL		
Tools: Spindl	e Good Hole Us #2 Centerdri e, rpm 32. g Fluid: 57	11; 19. <i>5</i>	/64 in.	pilot dri	ill; Grou Feed	up 1, Omar l: <i>HANO</i> :h: (Ind.	-0.51	PM	
Tool: Spindle Cuttine	Good Holes Us  SPECIAL  e, rpm O g Fluid:  ure:  READ  MOVE	BURI	VG BA	C WITH	Feed Dept	: <i>1/AN</i> h: (Ind.	(Reading)		
Surf Prot	s: Specimen face Finish, A trusion, in. pendicularity,	A <u>34</u> .001 i	- 45 / 6 n./gage	length	ole #1	<del>-</del>	Bluing	Pin Rol	lout
Capa	Longitudinal with Gage Reading acitance Gage the of Scratch,	g,'in. Reading in.	: _3	73		-	ε	09.	
		<u></u>		ar Posit			<del></del>	7	<del></del> ,
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	#2 #3 #4	0			0	0	0	0	0
	#5	0	0		_ 0	10		10	
Prot	ace Finish, AArusion, in endicularity,	•/7	15	un	le #2	<del>.</del>	Bluing	Pin Roll	out
Flus	Longitudinal C h Gage Reading citance Gage R h of Scratch,	, in. eading:	Transver	rse 100	I/INCH		90	0%	
		<u>A i</u>	r Gage f	Readings ar Positi	(.0001 i	<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2#3								
-	#4		0	0	0	0	0	0	0
	#5	0	+0.5	105	+0.5	+0.5	0	0	0

Test S	Series	_ Qual	ity Vari	able	SCRATO	HES-	AXIAL	<del></del>	<del> </del>
	e Good Hole U								
Tools:	#2 Centerdr	111; 19	/64 In.	ollot dr	ill: Grou	p 1. Omari	c Drill F	Reamer (T	LD2040AR1-5)
Spindl	e, rpm 32	5			Feed	HAND	-0.51	PM	
Cuttin	ig Fluid: 57	CDAAK	o Soc	VENT	Dept	: <u>Hano</u> h: (Ind.	Reading)	1.95	2
Modify	Good Holes U	sing Fol	llowing (	Condition	ns:				
Tool:	SPECIAL	BeRil	VG BA	c WITH	4 60°	SHALL PO	INTED	INSERT	
ap i na i	e, rpm				Feed	: //AN/ h: (Ind.	)		
	g Fluid:	DRY							
Proced	ure: REA	M GO	CO HO	LE I	HEN I	VSERT	BORING	BAR 1	NO TOUCH
	UP A	TROT	Tom C	OF HUG	EC	YESK I	USULAR	POSLITIC	N_AND_
	MOVE	RAI	MALL	1.005	THE	N RET	RACI	STRAIG	HT OUT
		<del></del>	<del></del>			<del></del>		<del> </del>	
Result	s: Specimen	No. <u>3</u>	AGT	<u>H</u>	iole #1				
Sur	face Finish, A	AA	18-14	un		<b>-</b>	Bluing	Pin Roll	out
Pro	trusion, in. pendicularity		169			-			!
Per	pendicularity,	, .001 1	n./gage	length	1				1
<b>5</b> 1	Longitudinal	003//NC			1/NCH	_	~ /	٠	i
Com	sh Gage Readir	ng, in. Dandina	-00	3		-	94	10	
	acitance Gage					-			1
vep	th of Scratch	, in	- 0	27		-			
		A	ir Gage	Readings	(.0001 i	n.)			
	Particular	,		ar_Posit					·
	Axial		1	-				1	1
	Position	0°	45°	90°	135°	180''	2 <b>25</b> °	270°	315°
	Bottom #1								
	#2						1		
	#3_								
	114	0	0	0	. 0	_0		0	2
	15	0	10	1_0_	1_0	0		1 0	
				Но	le #2				
	face Finish, A			um			Bluing	Pin Rolle	out
Prot	rusion, in.	•	169						
Perp	pendicularity,								ı
	Longitudinal	000			1/1004				
	sh Gage Readin			3			91	107	
	ncitance Gage th of Scratch,		38	4			80	10	
vepi	in or scratch,	10.		07		•			į
		A	ir Gao. f	Readings	(.0001 i	·.)			1
	Patrician Com de a matemate Com.	ست. ست. نمی		ar Posit				·	<del></del> ,
	Axial	00	AE0	000	1250	1000	225°	270°	315°
	Position	0°	45°	90°	135°	180°	225	270	315
	Bottom #1								
	#2								
				p. 1.4					
	#4	C			<u> </u>		0	0	0
	15	0	0	17	(C)		(3)		0

Test Se	eries <u>//</u>	_ Qual	ity Vari	able _	SCRATO	HES -	AXIAL		
Tools: Spindle	#2 Centerdre, rpm 32 Fluid: 57	111; 19 5	/64 in.	pilot dr	·ill; Grou	p 1, 0mar : <i>HAND</i> h: (Ind.	k Drill   -c.5   Reading	Reamer (T IPM 1.95	LD2040AR1-5
Tool: Spindle	re: REAL	Beria DRY M GO T Ba	CO HO	LE ,T	Feed Dept	: <u>HAN</u> h: (Ind. NSERT HECK A	u Reading) Borrac Maular	BAR A	NU TOUCH ON AND OHT OUT
Surf Prot Perp	: Specimer ace Finish, A rusion, in endicularity, Longitudinal	.001	90 n./gage	M.M. length	Hole #1	<u>-</u>	Bluing	Pin Rol	lout
Flusi Capa	h Gage Readin citance Gage h of Scratch	g, in. Reading , in.	.00 2.8 .0	1 38 06		- - - -	70	%	!
		<u>A</u>		Readings	s (.0001 i	<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3					-	10 10 10 10 10 10 10 10 10 10 10 10 10 1		
	#4	0	+0.5	+1	+ 0.5	0	t 0.5	+0.5	+ 0.5
Protr Perpe L	uce Finish, A rusion, in endicularity, ongitudinal.o Gage Reading	.001 i	n./gage Transve	length rse	ole #2		Bluing	Pin Roll	out
Capac	itance Gage I of Scratch,	Reading	3; 3;	72		.1	•	70%	ť
		<u>A</u>		Readings ar Posit	(.0001 i	n.)			Ī
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
<u>†</u>	#2 #3							<del>-</del>	
Ţ	#4	0	0	0	+ 0.5	0	0	0	0
		U	. 0	. 0	1 T U.3		. 0	1 /2	

INSPECTION SHEETS FOR TEST SERIES 12 - CHATTER

Test Se	eries 12	Quali	ty Varia	ble	CHAT	TER		·	
Tools: Spindle	Good Hole Us #2 Centerdri p, rpm p Fluid: ST	11; 19/ ///5	64 in. p	ilot dri	l; Group Feed:	1, Omark	VD - C	2.5 IPM	
Tool: Spindle		LH SP 1115 DRY NCE	IRAL P	ANER	<i>METR</i> Feed: Depth	i: (Ind.	LITM	HKES	
Surf Prot Perp Flus Capa	: Specimen ace Finish, A rusion, in. endicularity, Longitudinal h Gage Readincitance Gage Burr Height,	.001 i .001 i .00 g, in. Reading in.	0-/30 •/55 n./gage Transve /	length rese .00 202 25 Readings	(.0001 i	• •	Bluing	Pin Roll	out
	Axial	1		ar Posit		<del></del>	1	i	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom # #2 #3 5 #4 6	+2 +0.5 +0.5		+2 +0.5 +0.5	+2+1+0.5	+2 +1 +0.5	+2 + / + 0.5	+ a a + o, s	+ Q 0 + 0, 5
Prot Perp Flus Capa	ace Finish, Avrusion, inendicularity, Longitudinal _eh Gage Reading citance Gage F	.001 io .003//NC/ g, in. Reading	-10-0 :/ 3	Ho length rse 0	le #2			Pin Roll	
		<u>A</u>		Readings ar Posit	(.0001 i	<u>n.)</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
•	#2	,							
1	#4 6	+1	+ /	+0.5	+0.5	٥	0	+0.5	+0.5
	#4.7	0	0	()	0	1 ^		1 ()	( )

Test Se	eries <u>/</u> 2	Quali	ity Varia	able _C	WATTER							
Tools: Spindle	#2 Centerdri e, rpm g Fluid: 570	111; 19 <i>/</i> /// <b>S</b>	64 in. p	oilot dri	ill; Group Feed	p 1, Omari : <u>#<i>A NI</i></u> h: (Ind.	- 0.5	EPM				
Modify	Good Holes Us	ing Fol	lowing (	Condition	15:							
Tool:	2 FLUTE	LH	SPIRAL	PIN I	REAMER							
Spindle	e, rpm //	15			Feed	HAND	-0.5 2					
Cutting	g Fluid:	KY				n: (Ind.						
Procedu	CINT	ACT 1	HEN F	AMER I	NTO H	EEPER !	TIL IT	MAKES	<u> </u>			
Surf Prot Perp	s: Specimen face Finish, A trusion, in. pendicularity,	<u>در</u> A ا 001.	5- /40 . / <b>46</b> n./gage	length		-	Bluing	Pin Roll	out			
Flus Capa	Longitudinal. 003/NCHTransverse .002 /NCH Flush Gage Reading, in002 Capacitance Gage Reading: /28 Exit Burr Height, in.											
		۸	! - C	Dondines	( 0001 1	- \						
		^		ar Posit	(.0001 i	<u>n. /</u>						
	Axial	1	Angu.i	I POSLI	1011	1	<del> </del>	1	i			
	Position	0°	45°	90°	135°	180°	225°	270°	315°			
	Bottom #1											
	#2											
	MS		+2	+2	+2	±2	+2	+2	+2			
				0_		- <del> 1</del>	+0.5	-	10			
		+1.5	1+1.5	1 + 0.5	+0.5	1 +0.5	+0.5	+1	+ 1,5			
Prot	ace Finish, A		135	Min	le #2	•1	Bluing	Pin Roll	out			
	endicularity,		n./gage	-	<b>.</b>							
61	Longitudinal,	DELINCH			TINCH	• 11						
	h Gage Readin citance Gage			02		• 1						
	Burr Height,			7.6		•						
			· <del></del>	<del></del>	<del></del>	•						
		A		Readings ar Posit	(.0001 I	<u>n.)</u>						
1	Axial	· · · · · · · · · · · · · · · · · · ·	Angur	91 103	1 41							
1	Position 0° 45° 90° 135° 180° 225° 270° 315°											
	Bottom #1											
	#2											
-	125 +25 +25 +25 +25 +25 +3 +3 +3											
	11/2		0	0	0	0	0	+0.5	+0.5			
	187	0	0	+0.5	0	0	0	0				

Test Se	ries <u>12</u>	Quali	ty Varia	ble	CHA	TER			
Tools: Spindle	Good Hole Us #2 Centerdri , rpm Fluid: STO	11; 19/	64 In. p	ilot dri	11; Group Feed:	o 1, Omari : <u>//</u> n: (Ind.	AND -	0.5 1	pm
Tool: Spindle Cutting	re: AD	LH . HS DRY MNEE	SPIRAL	REBUS	REHINER Feed: Depth	$\frac{H}{1}$ : (Ind.	= UNT		MAKES
Surfa Proti Perpa I Flush Capac	specimen ace Finish, A rusion, in. endicularity, Longitudinal and Gage Reading itance Gage	.001 i .003/,xc g, in. Reading	0 − <b>§</b> 0 7 0 n./gage ⁄Transve	length rse	ole #1	-	Bluing	Pin Roll	out
		<u>A</u>		Readings ar Posit	(.0001 i	n.)			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2		-	-	·				
		+ 1.5	+1.5	71	+/	+1.5	71.5	7 62	72
]	1156	0	٥	+0.5	+0.5	0	70.5	+ 0.5	
Protr Perpe L Flush Capac	uce Finish, A cusion, in. endicularity, ongitudinal o Gage Reading itance Gage	.001 in. .001//AC g, in. Reading	16⊋ n./gage ∦Transve	length			Bluing	Pin Roll	out
		<u>A</u>	ir Gage I	Readings	(.0001 i	<u>n.)</u>			
T	Axial	i	Angul	ar Posit I	ion	1	1	1	
	Position	0°	45°	90°	135°	180°	225°	270°	315°
ŀ	Bottom #1								
t	#2	<u> </u>	<b>†</b>						
Ī									
1	#4		+1.5	+1	+1	+1	+1.5	+2	72
1	#5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5

Test S	eries 12	Quali	ity Varia	able	CHATT	ER	· · · · · · · · · · · · · · · · · · ·		
Tools:	e Good Hole Us #2 Centerdri e, rpm	111: 19/	64 in. 1	pilot dri	III; Grou Feed	p 1, Omar : <u>HA</u> A h: (Ind.	ND - 0.5	S IPM	
Modify	Good Holes Us	ing Fol	lowing (	`ondition	16 .				
	2 FLUTE					P			
Spindle	e, rpm	1115	77.5715		Feed	HAN	0 - 0.5	IPM .	
Cutting	g Fluid:	DRY				n: (Ind.	Reading)	-	
Procedu	ure: ADVA	UCE PI	N REAL	HER IN	ITO HOL	LE UNT	IL IT M	AKES	
	CONT	ACT 7	HEN F	EFD O	05 11 D	EFPER I	שם מאף	FLL	
	<del></del>				<del></del>				<del></del>
									<del></del>
Parulto	s: Specimen	No.	CAIR	u	1010 #1				
Surf	face Finish, A	Δ	11.	<u>, n</u>	ole #1		Bluing	Pin Roll	lout
Prot	rusion in	· _/>	179	MIN		-	bruing	1 111 1101	iout
Pero	trusion, in. pendicularity,	.001 i	n./gage	length	<del></del>	-			
	Longitudinal.	اعداده ه	JTransve	rse ,001	LINCH				
Flus	h Gage Readin	q, In.	. 0	01	11	-			
Capa	citance Gage	Reading	:	00		-			
	Burr Height					-			
	771	_				-			
		A			(.0001 i	<u>n.)</u>			
			Angul	lar Posit	ion	<del></del>	<del></del>		
	Axial	00	45°	000		1000	2250	2700	2170
	Position	0°	45	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2			<del> </del>	•		+	<del> </del>	
	#3				·		·	-	· <del> </del>
	#K S	+1	+0,5	+1	+1	+1	+/	+1	+1
	#8 6	+1	+1	+0.5	+0.5	0	+0,5	+1	$\perp$ + 1
					le #2		01	Di- D-11	
Surt	ace Finish, A	4 <u>/4</u>	0-180	Mm		•	bruing	Pin Roll	out
Prot	rusion, inendicularity,	001 1	35	lonath		•			
	endicularity, Longitudinal,				< line u				
Flue	h Gage Reading	n n	.00		3/1204	•			
			17			•			
Exit	citance Gage   Burr Height,	in.				•			
						•			
		Ai			(.0001 i	<u>n.)</u>			
				ar Posit			·		
	Axial		450	000	3.550	3000	2010	0700	] 3350
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	0-44								
	Bottom #1								<del>                                     </del>
1	#2					·			1
1	W.S.	+3	+2	+1.5	+1	+1	+1	+2	+2
	#96	+0.5	+0,5	+0.5	0	0	+0.5	+0.5	+0.5

Test Series	12	Quali	ty Varia	ble	CHAT	TER			
Produce Goo Tools: #2 Spindle, rp Cutting Flu	Centerdri m	11; 19/ ///5	64 in. p	ilot dri	11; Group Feed:	o 1, Omark : <u>#A</u> n: (Ind.	NO -	0.5 16	D2040AR1-5
Modify Good Tool: Spindle, rp Cutting Flu Procedure:	2 FL m 11 id:	UTE IE DRY DVANKE	ЬН S - - РЛ	PIRA	PIN) Feed: Depth	REMINE H. H. (Ind. TO HOLE DE" DETE	Reading)	<del>-</del>	
Protrusi Perpendi Long Flush Ga Capacita	Specimen Finish, A on, in. cularity, itudinal ge Readin nce Gage r Height	.001 in001 in003/INC	/ O − / / ∀/ n./gage -Transve	length rse 0 00 V	ole #1 /// (.0001 i	• • •	Bluing	Pin Roll	out
	•	<u>^</u>		ar Posit		<u>n. /</u>		·	<del></del> ,
	xial sition	0°	45°	90°	135°	180°	225°	270°	315°
Bo	ttom #								
	#56	+1	+0.5	+0.5	-1	-1.5 +1	+1.5	+1	70.5
Protrusion Perpendion Long Flush Gag Capacitar	Finish, Avon, in. cularity, itudinal, ge Reading nce Gage i r Height,	.001 ir .004///// g, in. Reading:	Transvei	length rse <u>.00</u> 2			Bluing	Pin Roll	out
		Ai	r Gage F	Readings ar Posit	(.0001 i	<u>n.)</u>			
	cial cition	0°	45°	90°	135°	180°	225°	270°	315°
Воз	tom #								
	#5 G	+0.5	00	0	0	0	0	+0.5	+0.5
			7.7						

Test Se	eries <u>12</u>	Quali	ty Varia	ble C	VATTE	ER				
Tools: Spindle	Good Hole Us #2 Centerdri p, rpm p Fluid: 570	11; 19/	64 in. p	ilot dri	11; Group	o 1, Omark : <u>HAND</u> n: (Ind.				-5)
	Good Holes Us  2 FLUTE									
Spindle	, rpm	ıs	SPIRM	PIN	Feed:	HAN	0 - 0.5	TPM		
Cutting	Fluid:					: (Ind.				
rocedu	re: AOVE	NCE	PIN R	EAMER	INT	HOLE	LANT	LIF	MAKES	
	CONT	ACT .	THEN	FERD	.005"	DEEPER	AND	DWELL	27	
				<del></del>			····			
									<del></del>	
Results	: Specimen	No. 50	CICT	, н	ole #1					
Surf	ace Finish, A	A 15	0 - 120	Min -		_	Bluing	Pin Roll	out	
Prot	rusion, in.	.13	1			_				
	endicularity,									
	Longi tudinal.	03 INCH			MINCH	-				
Flus	h Gage Reading	g, in.		62	•	-				
Capa	citance Gage I Burr Height,	Keading	::	72		-				
EXIC	Duri Height,	****				•				
		A	ir Gage	Readings	(.0001 i	n.)				
				ar Posit						
	Axial	1	1	1						7
	Position	0°	45°	90°	135°	180°	225°	270°	315°	1
			<del> </del>	<del> </del>		<del> </del>	<del>                                     </del>	<del> </del>	<del>                                     </del>	†
1.	Bottom #1					<del></del>	<del> </del>	<b></b>		4
	#3		ļ			-			<b>.</b>	4
	IN I	+2	+2	+1.5	+1.5	生品	+2	0	+1	4
	#97	+ 3	+2.5	+0.5	+1	+1.5	+2	+3	+1	7
	<del></del>		111.		·				<del></del>	-
				Ho	le #2					
Surf	ace Finish, A	200	- 220	Mm		•	Bluing	Pin Rolle	out	
Prot	rusion, in. endicularity,	, 10	61			•				
Perp	endicularity,	.001 ir	1./gage	length	1					
£1	Longitudinal. <u>e</u> h Gage Reading	eslineH	Iransvei	rse an	INCIA	•				
	n Gage Reading citance Gage R			2003		•				
•	Burr Height,	-		447		•				
LAIT	Dur. Height,					-				
		Ai	r Gage F	Readings	(.0001 i	<u>n.)</u>				
	-		Angul	ar Posit	ion					
	Axiai	00	450	000	1000	1000	2250	2700	315°	
	Position	0°	45°	90°	135°	180°	225°	270°	315	
	Bottom #1									
1	Bottom #1 #2					<del> </del>				
1	//3									
-	#10 5	+2	+1	0	0	0	0	+0.5	11.5	
	176	+1	+1	0	+0.5	+1	+ 2-	+0.5	10.5	

Test Se	eries <u>/2</u>	Quali	ty Varia	ble	C	HATTER	2		
Produce	Good Hole U	sing Fol	lowing (	`ondition	ne '				
Tools	#2 Centerdr	111. 19	64 in r	ilot dr	<u>13.</u> Ill: Grow	n 1 Omari	Orill R	eamer (Ti	D2040AR1-5
Spindle	e. rom	1115	01 III. p			<i>#</i>			
Cutting	e, rpm g Fluid: <u>ST</u>	TODIAN	SOL	VETVI	Dept	n: (Ind.	Reading)	1.9	50
Mod i fy	Good Holes U	sing Fol	lowing C	ondition	15:				
Tool:	3-6-017	5 hH	SPI	AL PI	N REAL	カモス			
Spindle	e, rpm	1115			Feed	HAIS	0-0.5	IPM	
		DRY				i: (Ind.			
Procedu	ire: A	DVANCE	PIN	READE V F-7	D . 00	HOLE S' PEET	INTIL PER AN	IT INA D DWS	KES
Results	: Specimer	No. <u>5</u>	A 3T		lole #1		Pluina	Din Poll	out
Suri	ace Finish,	w <u></u> 13	10-21C	1 11	<u> </u>	-	Bruing	Pin Roll	out
Prot	rusion, in. endicularity,	001	58	longet		-			
rerp	lengicularity,	, .001 1	n./gage	rength	/				
E1	Longitudinal h Gage Readir	· 003//N	Fansve	rse <u>· c</u>	OS//NCF	-			
Cana	n Gage Keadir	ng, rn.	. ———	•003		-			
Capa	citance Gage	keading			<del></del>	-			
EXIL	Burr Height	., III. —		<del></del>		-			
			: - C	Dood!noc	( 0001 :	- 1			
		<u> </u>	ir Gage	kead ings	(.0001 i	<u>n. /</u>			
	A 1-1	1	Angul	ar Posit	1 on	·	7	T	7
	Axial	0°	450	90°		1000	0000	0700	27.50
	Position		45°	90"	135°	180°	225°	270°	315°
р.	Bottom #								
	#				_]				
		+3	+2	+2	+2.5	+3	+0.5	+0.5	+2
	# 5		+1	+1	±1	+/	+1	+1	+/
	# G	+15	+1.5	J+1	+1	1+1	+1.5	71.5	11.5
	ace Finish, A	ιA <u></u> _	70 <b>–</b> 20		le #2		Bluing	Pin Roll	out
Prot	rusion, in. $\_$		./34						
Perp	endicularity,	.001 i	n./gage	length					
	Longitudinal·	004/11KM	Transve	rse	)				
Flusi	h Gage Readin	g, in.	.00	12					
Capac	citance Gage	Reading	2	17					
-	Burr Height		28/3						
		A			(.0001 i	<u>n.)</u>			
•			Angul	ar Posit	ion		·		<del></del> 1
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1			1					
]	#2								
I	#3								
1	# 5	+1.5	+1.5	+1.5	+1.5	+1.5	+1.5	+1.5	+1.5
]	#5.6	0	0	0	U	O	U	10	0

Test Se	eries /2	Quali	ty Varia	ble C	MATTE	<u>e</u>	- · · · · · · · · · · · · · · · · · · ·		<del></del>
Tools: Spindle	#2 Centerdri e, rpm	11; 19/ ///5	64 in. p	ilot dri	11; Group Feed	p 1, Omark : <u>HAN</u> h: (Ind.	0 - 0.5	TPM	
Modify	Good Holes Us	ing Fol	lowing (	ondition	5:				
Tool:	2 FLUTE	LH	SPIRAL	PIN	REAMER				
Spindle	, rpm	1115			Feed	HAN	0.5		
	Fluid:	DRY				n: (Ind.			
Procedu	re: ANNA	JCE F	IN RE	MER	NTO H	DLE UN	STIL 17	MAK	ES
	CINTA	CT, TI	VEN FI	ED .00	S. DE	EPER A	DO DOE	Ш	
				<del></del> .			-		
	: Specimen				ole #1		01.1.	01 011	
	ace Finish, A			Mm		-	Bluing	Pin Roll	out
Parn	rusion, in endicularity,	001 i	1 /nane	length		-			
	Longitudinal.				4 line H				
Flus	h Gage Readin	q, in.	. 0 (			-			
Capa	citance Gage	Reading	:	7.2~		-			
Exit	Burr Height	, In.				<del>-</del>			
					/ 0001 1				
		<u>A</u>			(.0001 i	<u>n.)</u>			
	Axial	1	Angui	ar Posit	Jon.	1	T	1	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	-								+
	Bottom #1								1 1
	#2			<u> </u>	<u> </u>				
	#3	+1.5	+2	+ 2	+2		<del> </del>	45	+
	#56	0	0	0	+0.5	+0.5	1 6	+2	+1,5
	176		<u> </u>	1_9	1 . 0 . 0	1 40.0			1 0 1
					le #2				
Surf	ace Finish, A	A 180.		1 in			Bluing	Pin Rolle	out
	rusion, in.		, 161	longth					
rerpo	endicularity, Longitudinal	.001 11	Transve	rse 100	a 1	u			
	h Gage Reading		,0		- 1/20	3			
	citance Gage					•			
	Burr Height,					•			
		<u> </u>	r Gage I	Readings	(.0001 i	<u>n.)</u>			
1	Axial		Angul	ar Posit	ion	<del>,</del>			,
	Position	0°	45°	90°	135°	180°	225°	270°	315°
ļ	TUST LTUIT		<del></del>		100				
	Bottom #1		L						
]	#2								
4	#3					ļ <u>,</u>			
	#45		+1.5	+1	+1	+1	+1	+1,5	+1.5
1	#86	+0.5	+0.5	+0.5	10.5	1+0,5	+0.5	+0.5	+0,5

Test Se	eries /2	Quali	ty Varia	ble	CHI	ATTER			
Tools: Spindle	#2 Centerdrie, rpm	111; 19/ 1/5	'64 in. p	ilot dri	ill; Group Feed:	o 1, Omark :	9ND -	0.5 14	m
Modify	Good Holes Us	ing Fol	lowing C	ondition	is:				
Tol:	2-FLUTE	LH	SPIRAL	PIN	READY	R		··	
indle	, rpm	TITE			Feed		NA- O		1
Cutting Procedu	Fluid:	DRY	. 0	D ^		: (Ind.			0.4.26
rroceut	ire: A	ONTROC	7 TM	-AL E	STATE OF THE PARTY	OC5" DE		200 000	HKES
		JA I AC	1 186		EE /)	OCS DE	ERCR. I	TIVE DW	
Surf Prot Perp	s: Speciment ace Finish, A rusion, inendicularity, Longitudinal .	.001 i	40 - /50 •185 n./gage ⊬Transve	length	2/INCH	-	Bluing	Pin Roll	out
Flus	h Gage Readin	g, în.		001		•			
capa	Crtance Gage	Reading	•	מדינ		-			
Exit	t Burr Height	, in			<del></del>	_			
		А	ir Gage	Readings	(.0001 i	n.)			
	<del></del>	,		ar Posit				· · · · · · · · · · · · · · · · · · ·	<u></u>
	Axial	1						1	
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
•	#2				<del></del>		<del> </del>		1
	#3 4	0	8	0	8	0_	0	0	0
	115	0	0	0	0	0	0	0	0
	#96	ــــــــــــــــــــــــــــــــــــــ	4	L	<u> </u>	<u> </u>	L	ļ	
Prot Perpo Flusi Capa	ace Finish, A rusion, In. endicularity, Longitudinal, h Gage Readin citance Gage	.001 in 002/4 c g, in. Reading	./86 n./gage Aransvei	length rse 0			Bluing	Pin Roll	out_
		<u>A</u>			(.0001 I	n.)			
1	<del></del> -		Angul	ar Posit	ion	<del>y</del>			,
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
1	#3	<del></del>		<b></b>					
	14	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5
	15	0	0	0	0	0	0	0	0

Test Se	ries 12	Quali	ty Varia	ble	CHA	TER			
Tools:	#2 Centerdri	111; 19/	64 in. p	ilot dri	11; Group				
Cutting	, rpm Fluid: <u>S</u> 7	DPO CR	O SOL	VENT	Dept	: <u>////</u> n: (Ind.	Reading)	1.5	50
Modify (	Good Holes Us	sing Fol	lowing C	ondition	ns:				
Tool:	2-FLU	E 4				3/n=2	470 . 0	<del></del>	0.40
Cuttina	, rpm Fluid:	Dev				n: (Ind.	Reading)	0.5	PM
Procedu	re: <u>ADv</u>	ANKE	PIP R	EANIER	INTO	HOLE			ES
	CON	TACT,	THEN	FFET)	1005"	DEEPE	R AND		
Results	: Specimen	No. 5	ADCA	н	lole #1		···		
Surfa	ace Finish, A	A /	40-180	1 /4 11			Bluing	Pin Roll	lout
Proti	rusion, in. endicularity,		182	·		<del>-</del>			71
Perpe	endicularity,	.001 i	n./gage	length					
Flush	ongitudinal, Gage Readin	a. in.	المانة الم	23		-			
Capac	itance Gage	Reading	: 2	570		-			
Exit	Burr Height	, in				_			
		۸	ir Cana	Pandings	(.0001 i	n )			
_		2		ar Posit		<u>11.7</u>			
I	Axial			1					
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
	#2								
	#3_	+0.5	+1	+1	+1				+=,
	#5	0	0	0	17	+1	11	+1	+1
				· · · · · · · · · · · · · · · · · · ·					
S	ice Finish, A	Λ .	100-20		le #2		Bluing	Pin Roll	out
Protr	usion, in.	^	.133	4) 14	//	•	Diding	1 111 11011	<u> </u>
Perpe	indicularity,	.001 11	n./gage	length		•			
	ongitudinal,	001/1Ni			2/ NCF				
	Gage Readin				<u> </u>	•			
	itance Gage		·	93		•			
EXIL	Burr Height					11_			
		A		Readings ar Posit	(.0001 i	<u>n.)</u>			
T	Axial	1				1			
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1								
+	#2	ļ				ļ			
+	#4	+2.5	+2.5	+2	+1.5	+115	+3.5	+3	+5
İ	#5	+1	+1	41	+1	+0.5	+1	+1	+1

INSPECTION SHEETS FOR TEST SERIES 12 TEARS, LAPS, PLASTIC DEFORMATION

MANUFACTURING REPORT: TAPERED HOLES											
Test So Specimo	eries <u>/2</u> en No. <u>3/3/</u> /	Qual	ity Var	iable <u>Z</u>	EARS, L.	APS, PLA	STIC DE	FORMATION			
Hole Ma	anufacturing  CurreR	Conditio	ons and	Procedu	res: Z	APER R	EAM W	TH BUILT			
Spir Cut	ndle, rpm <u>2</u> ting Fluid:	720 R DRY	PM	F D	eed: epth: (i	.00/5 nd. Read	/ <i>PR</i> ding) _	1.710			
	face Finish, A		20	Hole #1		Blu	ing Pin	Rollout			
Perp L	Perpendicularity, .001 in./in. Longitudinal 7 Transverse , 25										
Flush Gage Reading, in. ioo2 Capacitance Gage Reading ./93 Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2										
	#3 #4	.0	1.5	1.5	1.5	1.0	1.0	1.0			
	#5	3.0	3.0	3.0	2.5	3.0	3.0	3.0			
Prot Perp Flus Capa	Surface Finish, AA 100-105  Protrusion, in. 2/8  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse .005  Flush Gage Reading, in001  Capacitance Gage Reading ./9/ Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2						-15				
	#3 3.0 3 C 3.0 3.0 3.0 3.0 3.0 44 1.0 15 1.5 1.5 1.5 1.5										
	#5	1.5	1.5	1.0	1.5	1.5	. 5	1.0			

MANUFACTURING REPORT: TAPERED HOLES											
Test So Specime	eries <u>/2</u> en No. <u>582</u>	Qual <b>c</b> 8	ity Var	iable 2	TEARS, L	APS, PLA	STIC DE	FORMATION			
	nufacturing  Gurrer	Conditi	ons and	Procedu	ıres: <u>Z</u>	APER K	EAM W	TH BUILT			
Spin Cutt	ndle, rpm <u>2</u> ing Fluid:	720 R DRY	PM		eed: epth: (	.00/5 Ind. Rea	/ <i>PR</i> ding) _	1.710			
Surf	Surface Finish, AA ///-/20 Bluing Pin Rollout Protrusion, in. 225										
Perp L	Perpendicularity, .001 in./in. Longitudinal .401 Transverse .001										
Flush Gage Reading, in											
Exit Burr Height, in.  Air Gage Readings (.0001 in.)											
Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1										
	#2				-						
	#3	45	1.0	1.5	1.5	1.5	10	15			
	#5	2.0	2.0	7.0	120	3.0	5.0	2.0			
			13.10	13.1		1.2.12		131.54			
Protr	usion, in.	, 22	1-80	Hole #2		Blui	ng Pin	Rollout			
	endicularity, ongitudinal			rse .a.	205-						
	Gage Readin		.00	1							
Capac	itance Gage	Reading		12							
Exit	Burr Height,	in									
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1										
İ	#2										
	#3 .5 .0 .0 .0 .0 1.0 1.0										
}	#4	7.0	70	3.5	9.0	20	1.0	4.7			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>/2</u> en No. <b>48.3</b> 4	Qual	ity Var	lable 2	TARS, L	APS, PLA	sric Di	ree Marion			
Hole Ma	nufacturing  Currer		ons and	Procedi	ires: Z	APER X	ran K	rn Bunt			
Spin Cutt	Spindle, rpm Z720 RPM Feed: .0015 IPR Cutting Fluid: DRY Depth: (Ind. Reading) 1.710										
Surface Finish, AA 93-87  Protrusion, in. 1222  Perpendicularity, .001 in./in.											
Longitudinal Transverse.001 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1										
	#3	15	1.5	1.5	1.5	.0	15	1.5			
	#5	1.5	10	1.0	1.8	1.5	1.0	1.0			
Proti Perpe L Flust Capac	Surface Finish, AA 108-110  Protrusion, In. 100  Perpendicularity, .001 in./in.  Longitudinal 10 Transverse 10  Flush Gage Reading, in. 1003  Capacitance Gage Reading 199  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315"			
	Bottom #1 #2										
	13 1.0 1.0 1.0 1.5 .5 1.0 1.0										
	#4 #5	1.5	1.0	1.5	1.5	1.0	1.5	1.3-			

MANUFACTURING REPORT: TAPERED HOLES											
Test Sei Specimer	ries 12 n No. 481	Qual	ity Var	iable /	TEARS, L	APS, PLA	sric Di	e formation			
	nufacturing	Conditi	ons and	Procedu	ares: Z	APER K	EAN W	Irn BULLT			
Spind Cutti	Spindle, rpm <u>2720 RPM</u> Feed: <u>.00/5 /PR</u> Cutting Fluid: <u>DRY</u> Depth: (Ind. Reading) <u>/.7/0</u>										
Hole #1  Surface Finish, AA 55-58  Protrusion, in. , 226  Perpendicularity, .001 in./in.  Longitudinal ,6005 Transverse ,001  Flush Gage Reading, in. ,001  Capacitance Gage Reading ,186  Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	#2 #3 #4 #5	1.0	.0	.5	1.0	*1.0 .0 2.5	.0	1.0			
Protru Perpen Lo Flush Capaci	Surface Finish, AA 70-75 Protrusion, in. , 2/3 Perpendicularity, .001 in./in. Longitudinal Transverse COI Flush Gage Reading, in. , CC2- Capacitance Gage Reading , 206 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 .										

MANUFACTURING REPORT: TAPERED HOLES											
Test So Specime	ries <u>/2</u> en No. <b>3</b> <i>R</i> / <i>A</i>	Qual	ity Var	iable Z	EARS, L	APS, PLA	STIC DA	FORMATION			
Hole Ma	nufacturing	Conditi	ons and	Procedu	res: Z	APEAR	EAM W	en Built			
Spindle, rpm <u>2720 RPM</u> Feed: <u>.00/5 /PR</u> Cutting Fluid: <u>DRY</u> Depth: (Ind. Reading) <u>/.7/0</u>											
Surface Finish, AA 50 Protrusion, in227 Perpendicularity, .001 in./in. Longitudinal .00/5 Transverse 0 Flush Gage Reading, in0 Capacitance Gage Reading .2/9											
Capacitance Gage Reading , 2/9 Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2										
	#3 #4 #5	2.0	1.0	1.0	1.0	1.0	1.0	1.0			
Protr Perpe L Flush Capac	Hole #2  Surface Finish, AA /00-/05  Protrusion, in										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
Bottom #1  #2  #3 3.0 3.0 3.0 3.0 3.0 3.0 3.0 2.5 3.0  #4 1.0 1.0 1.0 5 1.0 5 1.0											

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>12</u> en No. <u>524</u>		lity Var	lable	tears, L	APS, PLA	sric Di	FORMATION			
	anufacturing	Condit	ions land	Proced	ures: Z	APER K	EAN W	TH BULLT			
Spir Cutt	ndle, rpm ting Fluid:	DRY	RPM		Feed: Depth: (	. <i>00/5</i> Ind. Rea		1.710			
				Hole #	1						
Surf	face Finish,	AA	73-8			Blu	ing Pin	Rollout			
Protrusion, In											
Perpendicularity, .001 in./in.											
Longitudinal <u>col</u> Transverse <u>coos</u> Flush Gage Reading, in. — <u>, oo 2</u>											
Capacitance Gage Reading 184											
Exit Burr Height, in.											
Air Gage Readings (.0001 in.)											
	Angular Position										
	Axial .										
	Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	<del></del>	<del></del>			<del></del>		-			
	#2	2.5	2,5	2.0	2.0	2.0	2.5	2.5			
	#4	10	1.0	18.6	18:5	1.0	13	10			
	#5	1.0	1.0	1.5	1.0	116	15	1.0			
				Hole #2							
Surfa	ace Finish,	AA _9	0-95			Blui	ing Pin	Rollout			
	rusion, in.										
	endicularity				00.						
	Longitudinal h Gage Readi				<i>vo</i> 3						
	citance Gage		.00	79				ļ			
	Burr Height										
		-			<del></del>						
		<u> </u>	Air Gage			1 in.)		ł			
Angular Position											
	Axial										
	Position 0° 45° 90° 180° 225° 270° 315°										
	POSITION	L	177	30	100	223	2/0	כונ			
	Bottom #1										
	#2		1		1						
	#3 . 6 1.0 1.0 1.5 1.5 1.5										
	#4	1.0	1.5	.3-	1.5	.5	7.5	1.5			
	#5	1.0	4 0	115	1.0	11.5	1.5	1.0			

Hole #2  Surface Finish, AA 100-103  Protrusion, in. 210  Perpendicularity, .001 in./in.  Longitudinal .01 Transverse .002  Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 #2		M	ANUFACT	JRING RE	PORT:	TAPERED	HOLES		
Spindle, rpm 2720 RPM Cutting Fluid: DRY Depth: (Ind. Reading) 47/0  Hole #1  Surface Finish, AA 28-32 Bluing Pin Rollou Protrusion, in. Longitudinal 2005 Transverse 2005  Flush Gage Reading, in. O Capacitance Gage Reading 7217  Bottom #1 Bluing Pin Rollou Pin Pin Rollou Pin Rollou Pin P			Qual	ity Var	iable	TEARS, L	APS, PL	ASTIC D	FOR MANO
Surface Finish, AA  Protrusion, in.  Longitudinal Macs Transverse CS Flush Gage Reading, in.  Capacitance Gage Reading  Bottom #1  Surface Finish, AA  Air Gage Readings (.0001 in.)  Angular Position  Axial Position  Position  Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal Macs Transverse .CS  #4 7.0 4.5 4.0 4.5 7.5 6.0 4.0  #5 12.5 12.6 11.0 7.0 2.0 10.0 9.0  Hole #2  Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal Macs Transverse .002  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position  Air Gage Readings (.0001 in.)  Angular Position  Air Gage Readings (.0001 in.)  Angular Position				ons and	Procedi	ures: 2	APER)	REAM U	ATH BULLT
Surface Finish, AA 28-32 Perpendicularity, .001 in./in. Longitudinal	Spin Cutt	ndle, rpm ing Fluid:	2730 ) DRY	PPM			. 00/3 Ind. Rea		1.710
Angular Position    Axial	Prot Perp L Flus Capa	rusion, in. endicularit ongitudinal h Gage Read citance Gage	y, .001 y, .001 ing, in. e Readin	27 in./in. Transve	rse <u>.00</u>		В1	uing Pin :	Rollout
Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1  #2  #3 9.0 9.0 7.0 7.0 5.5 8.0 3.0 #4 7.0 6.5 6.0 4.5 7.5 5.0 1.0 #5 12.5 12.0 11.0 7.0 8.0 10.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0			• •				01 in.)		
#2 #3 9.0 9.0 7.0 7.0 5.5 8.0 3.0 #4 7.0 6.5 6.0 4.5 3.5 5.0 1.6 #5 12.5 12.0 11.0 7.0 8.0 10.0 9.0  Hole #2  Surface Finish, AA /00-/03 Bluing Pin Rollout Protrusion, in. 3-10 Perpendicularity, .001 in./in. Longitudinal .00/ Transverse .002 Flush Gage Reading, in002 Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.) Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 #2		1	0°	45°	90°	180°	225°	270°	315°
Surface Finish, AA 100-103 Protrusion, in. 2-10 Perpendicularity, .001 in./in. Longitudinal 17 Transverse .002 Flush Gage Reading, in. 202 Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.) Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315° Bottom #1 #2		#2 #3 #4	9.0 7.0 12.5	9.0 6.5 12.0	7. C 6.0 W.O	7.0	5.5 3.5 8.0	5.0	3.C 1.C 9 0
Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 #2	Proti Perpe l Flush Capac	rusion, in. endicularity Longitudinal n Gage Readi citance Gage	ng, in.	2-10 in./in. Transve	rse , <u>o</u>		Blu	ing Pin	Rollout
Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1			4	Air Gage Angu	Reading lar Pos	gs (.000 ition	1 in.)		
#2			0°	45°	90°	180°	225°	270°	315°
#4 8.0 7.0 5.5 6.0 6.5 2.0 3.5		#2	5.0	5.C	3.0	8.0	8.0	4.0	4.0

MANUFACTURING REPORT: TAPERED HOLES											
	ries <u>12</u> n No. <b>3</b> /1/1		ity Var	iable Z	FARS, L.	APS, PLA	STIC DA	FORMATION			
	Hole Manufacturing Conditions and Procedures: <u>TAPER REAM WITH BUIL</u> T  UP GUTTER										
Spin	dle, rpm <u>Z</u> ing Fluid:	720 R DRY	PM			. <i>00/5</i> Ind. Rea		1.710			
Prot Perp L Flus	Hole #1  Surface Finish, AA / 5 - 108  Protrusion, in. / 1/4/  Perpendicularity, .001 in./in.  Longitudinal / C(1 Transverse , C(2 Flush Gage Reading, in. / C(1 Capacitance Gage Reading 2/3										
	Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
	Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2					14.6					
	#3 #4 #5	3.0	12.C 5.0 1.5	12.0	1.0	12.0	2.5	3.5			
Proti Perpo L Flush Capac	Surface Finish, AA 103-105  Protrusion, in. 123  Perpendicularity, .001 in./in.  Longitudinal C Transverse 1002  Flush Gage Reading, in. 1001  Capacitance Gage Reading 193  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 \$.0 6.6   12.0 7.0 7.0 5.0 3.5 #4 1.0 7.0   10.0 4.0 3.5 3.0 .0										

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>/2</u> en No. <u>5E</u> (	Qual	ity Vari	iable <u>/</u>	EARS, L.	APS, PLA	STIC DE	FORMATIO			
	anufacturing  Currer	Conditio	ons and	Procedu	res: Z	APEA R	EAM W	TM BUM1			
Spir Cut	ndle, rpm <u>Z</u> ting Fluid:	720 R DRY	PM		eed: epth: (1	. <i>00/5</i> nd. Read		1.710			
Prot Perp	Surface Finish, AA 38. 42 Bluing Pin Rollout Protrusion, in										
Flus Capa	Longitudinal <u>COI</u> Transverse <u>CO25</u> Flush Gage Reading, in. O  Capacitance Gage Reading <u>267</u> Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1										
	#2	1.0	1.5	2.0	2.0	2,0	2.0	2.5			
	#4	1.0	15	.5	15	1.0	1.5	1.5			
		17	1.43	1 10	1.63	1 . 3					
Proti Perpo I Flusi Capac	Surface Finish, AA  Protrusion, in.  Longitudinal OO2 Transverse OCOS  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1										
	#3 1.0 1.0 1.5 1.5 1.0 2.0 2.0										
	#4 #5	1.0	1.0	1.0	15	1.0	1.0	1.5			
	· · · · · · · · · · · · · · · · · · ·	4	1.0	1.6	<u> </u>	- 6		<u> </u>			

r											
	М.	ANUFACT	URING RE	PORT:	TAPERED	HOLES					
Test Sc Specime	eries $\frac{12}{3A.3}$		lity Var	iable (	TEARS, A	LAPS, PL	ASTIC DA	S FOR MATION			
	nufacturing <i>Gurrer</i>	Condit	ions and	Proced	ures: ½	APER)	REAM W	Irm BULLT			
Spin	dla rom s	7774	8011		e a d i	00.	C (DD				
Cutt	idle, rpm <u>2</u> ing Fluid:	DRY	<del>XPM</del>	i	Depth:	.00/3 (Ind. Rea	ading)	1.710			
				Hole #1							
Surf	ace Finish,	AA	140-	143		Blu	ing Pin	Rollout			
Protrusion, in. , 22/ Perpendicularity, .001 in./in.											
Longitudinal O Transverse. CO4											
Flush Gage Reading, in. <u>.ccl</u>											
Capacitance Gage Peading 223											
Exit Burr Height, in.											
Air Gage Readings (.0001 in.)											
Angular Position											
	Axial										
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	1			1						
	#2	-	<del></del>	<del></del>							
	#3	115	1.0	1.0	1.0	1.0	1.0	1.5			
	#4	1.0	15	. 5	1.5	1.5	10	1.0			
	#5	1.5	1.0	1.5	10	,5	1.5	1.0			
Surfa Proti	ace Finish,	AA	125.1	Hole #2		Blu	ing Pin	Rollout			
Perpe	endicularity	, .001	in./in.								
	ongitudinal		Transve	rse 'O	<u>C</u> /						
	Gage Readi			-	<del></del>			1			
	itance Gage Burr Height										
EXIL	buil height	, '''' -						İ			
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
			-			<del> </del>					
	Bottom #1 #2				<del> </del>	+		-			
	#3 1.5 1.5 2.0 20 2.5 2.5										
	#4	1.0	1.0	1	1.5	1.0	.0	1.0			
	#5	1.5	1.5	1.0	2.0	1.0	1.5	1.1			

INSPECTION SHEETS FOR TEST SERIES 17 - OVALITY

	м	ANUFACTU	RING RE	PORT: T	APERED	HOLES					
	eries <u>17</u> en No. <u>383</u>	Qual	ity Var	iable <u>C</u>	DVALI	TY					
1					-		444	Std			
Hole M	anufacturing PEAMER FOR	HIN. IN	ons and TERFER	FNCE.	res: /A	PERKER UT STA	AIGHT F	24.50			
5105	ndle, rpm	CEAMER.	HOUE :	\$.007 A	eed:	OOIS	LT TO PRO	auce Ovaca			
Cut	ting Fluid:	Der		De	epth: (	nd. Rea	ding)	1.130			
Sur	face Finish	ΔΔ		Hole #1		R1	ina Pin	Rollout			
Surface Finish, AA 125 Bluing Pin Rollou Protrusion, in. 127											
Perpendicularity, .001 in./in. Longitudinal O Transverse , 002											
Flush Gage Reading, in002 Capacitance Gage Reading 263											
	t Burr Height					2	🞉				
Air Gage Readings (.0001 in.) Angular Position											
318/3		-0				22.50	1	1			
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	3.0	4.0	4.0	3.0	3.0	6.0	4.0			
	#3	2.0	8.0	10.0	3.0	7.0	11.0	8,0			
	#4	6.0	12.0	13.0	0	10.0	13.0	12.0			
<del></del>				tole #2							
	ace Finish, I		95-10	20		Blui	ng Pin f	Rollout			
Perp	endicularity	, .001			•	1	7.7	444			
	Longitudinal h Gage Readi				<u> </u>						
	citance Gage Burr Height,		296		_ `						
			r Gage	Readings	 . ( 0001	in'.)					
317/	319/323 Air Gage Readings (.0001 in'.) Angular Position										
	Axial	-0	1.50	0.00	1000	2250	2700	315°			
	Position	0°	45°	90°	180°	225°	270°				
	Bottom #1 #2	5.0	-9.0 1.0	5.0	5.0	2.0	5.0	2.0			
	#3	50	6.0	11:0	50	5.0	11.0	6.0			
	#4 #5	6.0	11.0 15.0	13.0	6.0	10.0	10.0	0.0			

	МА	NUFACTU	IRING RE	PORT: 1	TAPERED	HOLES				
	deries $\frac{17}{30/13}$	Qual	ity Var	iable	OVALI	אדי		C % /		
Hole Manufacturing Conditions and Procedures: TAPERREAN WATH GENTER FRANKE FOR MIN. INTERFERENCE. BRCK OUT STRAIGHT FLUTED  SIOS CUTTING TAPERRAMER. MAVE \$.007 AND PLUNGE CUT TO PROMISE OWNTH Spindle, rpm 660 Feed: .00/5  Cutting Fluid: Dey Depth: (Ind. Reading) /.130										
C	Hole #1 Surface Finish, AA 120-125 Bluing Pin Rollout									
Protrusion, in. 123										
Perpendicularity, .001 in./in. Longitudinal O Transverse 2002										
riush dage Reading, in.										
Capacitance Gage Reading <u>305</u> Exit Burr Height, in.										
Air Gage Readings (.0001 in.)										
514		<u>'</u>		lai i'os		-,	_			
	Axial Position	00	45°	90°	180°	225°	270°	315°		
	Bottom #1	-2.0	-2.0	2.0	-40	-10	0	-40		
	#2	5.0	5.0	2.2	8.0	14.0	1.0	5.0		
	# li	20	12.0		19.0	1		12.6		
	#5	8.0	_		11/10	_		1/3		
۶ <b>۶</b>	non Cimirk A	٨		Hole #2		Rlui	na Pin	Rollout		
Prot	ace Finish, Arrusion, in.	128	85-9	<i>Q</i>		<u> </u>		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
	endicularity, Longitudinal		n./in. Transver	·sc /		5/				
Flus	h Gage Readin	g, in.	1001		= 60	5%	n satel			
	citance Gage   Burr Height,		3/2				. ***			
		_								
319/323 Air Gage Readings (.0001 in.) Angular Position.										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	6.0	-3.0	-6.0	-6.0	-7.0	. 8.0	-8.0		
	#2	5.0	6.0	5.0	3.0	30	4.0	2.0		
	#3	7.0	10.0	14.0	4.0	10.0	13.0	6.0		
	#5	7.0	13.0		4.0	11.0	13.0	10.0		

Test Series   17    Quality Variable   OVALITY			MA	NUFACTU	IRING RE	PORT: 7	APERED	HOLES					
Surface Finish, AA   100   180°   180°   225°   270°   315°   170   180°   18	Test S Specin	Scries nen No. <u>4</u>	17 056	Qual	ity Var	iable <u>(</u>	OVALI	TY					
Surface Finish, AA	Sion Spi	Curring TA ndle, rpr	PER E	TIN.IN TAMER. 660	MOVE	ENGE. 1	BRGK O AND PA eed:	47 578 4468 CL	AIGHT F	MCE OVALT			
Axial Position: 0° 45° 90° 180° 225° 270° 315° Bottom #1 6.0 -8.0 -3.0 -6.0 -7.0 -7.0 -7.0 -7.0 -7.0 -7.0 -7.0 -7	Pro Per Flu Capa	trusion, pendicula Longitudi sh Gage R acitance	in. rity, nal <u>.</u> leadin Gage	.001 .005 .005 .005 .005 .005 .005 .005	in./in. Transver <b>O</b>	Hole #1		<u>Blu</u>					
Axial				-				1 in.)					
#2 #.0 0 8.0 5.0 5.0 10.0 14.0 14.0 #4 14.0 15.0 5.0 5.0 12.0 14.0 14.0 #4 14.0 15.0 5.0 5.0 12.0 14.0 14.0 #5 14.0 14.0 15.0 6.0 7.0 13.0 13.0 13.0 13.0 13.0 13.0 13.0 13			o:i	0°				225°	270°	315°			
#3   1.0   7		Bottom				-3.0			+	+			
#4   14.0   13.0   15.0   13.0   13.0   14.0   15.0   13.0													
Hole #2   Surface Finish, AA   100 110   Bluing Pin Rollout									<del></del>				
Surface Finish, AA					-	<del></del>	6.0			<del> </del>			
Angular Position.  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 - 8.0 - 4.0 - 1.0 - 8.0 - 4.0 - 6.0  #2 3.0 2.0 5.0 3.0 4.0 5.0 3.0  #3 4.0 3.0 9.0 4.0 5.0 6.0  #4 3.0 5.0 14.0 7.2	Prot Perp Flus Capa Exit	Surface Finish, AA 100-110 Protrusion, in. 125 Perpendicularity, .001 in./in. Longitudinal 169 Transverse .002 Flush Gage Reading, in001 Capacitance Gage Reading 276 Exit Burr Height, in.											
Bottom #1 -8.0 -4.0 -1.0 -8.0 -4.0 -4.0 -6.0  #2 3.0 2.0 5.0 3.0 4.0 5.0 3.0  #3 4.0 3.0 9.0 4.0 7.0 18.0 6.0  #4 3.0 5.0 14.0 15.0 14.0 7.1		Axial		-0				2259	2709	21.59			
H2 3.0 2.0 5.0 3.0 4.0 5.0 3.0 H3 4.0 3.0 9.0 4.0 7.0 18.0 6.0 H4 3.0 5.0 14.0 4.0 15.0 14.0 3.1		Positio	n	00	45"	90"	180°	225	2/0	315			
			#2 . #3	3.0		5.0	3.0	4.0	5.0	3.0			
					_		4.0	13.0	14.0	7:1			

	М	ANUFACTU	RING RE	PORT: 1	TAPERED	HOLES						
	Series $\frac{17}{2/3}$	Qual	ity Var	iable _	OVALI	TY						
Hole M	tanufacturing PEAMER FOR Curring TAPER	Condition Min. In	TERIFER	ENGE.	BACK O	UT ST	RAIGHT F	44750				
5p i	ndle, rpm ting Fluid:	660 Dey		F	ced:	.00/\.lnd. Rea						
Hole #1 Surface Finish, AA 95-100 Bluing Pin Rollout												
Pro	trusion, in. pendicularity	129				<u> </u>						
,	Longitudinal sh Gage Readi	1001 7	ransver		2	ás.	,					
Cap	acitance Gage t Burr Height	Reading		\$3	{	2019		:				
7	Z .	-	ir Gago	Reading	 gs_(.000	(1 in )		Marke.				
319	<b>グ2ン</b>	-	Angu	lar Pos	ition	111.7						
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-7.0	-8.0	-10	-6.0	-10.0	-7.0	-60				
	#3	3.0	7.0	12.0	6.0	10	1:0	2.0				
	#14	5.0	11.0	140	5.0	11.0	13.0	11.0				
	#5	8.0	12.0	14.0	5.0	12.0	12.0	120				
	ace Finish, / rusion, in.		100-11	iole #2 0		Blui	ng Pin I	Rollout				
	endicularity Longitudinal			SA 100	7			i i				
Flus	h Gage Readir	ng, in.	001			مر		n. 349m				
	citance Gage Burr Height,		2.3.5		U	) C		- wh				
21	C/212	Ai	r Gage	Reading	s (.0001	in.)		д.				
3/	8/323		Angul	ar Posi	tion_							
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-5.0	-3.0	-//.0	-4.0	-6.0	60	-6.0				
	#2	7.0	1.0	13.0	3.0	120	9.0	10.0				
	#4	8,0	14.0	15:0	2.0	15.0	13.0	11.0				
	#5	110	12.0	13.0	7.0	12.0	12.0	12.0				

		MAN	UFACTU	RING RE	PORT: 1	APERED	HOLES		
	ieries nen No. 5	7	Qual	ity Var	lable _	OVALI	TY		
Sior Spi	lanufactur Pennen F Currug Tar ndle, rpm ting Fluid	en M	IN.ZM	HOVE :	ENGE	BAGK O AND PAG eed:	UT STA	TAISHT!	14750
					Hole #1				
	face Finis trusion, i	-	^ <del></del>	2 75-1	00		<u>81u</u>	ing Pin	Rollout
	pendicular					4		1	=.
Flus	Longitudin sh Gage Re	ading	), in.	0	01		20		*
	acitance G t Burr Hei			25	16		١.		Service Control
		J,			0	<del></del>			
319/32	4		<u> </u>		ilar Pos	gs (.000 ition	I in.)		
	Axial Positio	n	0°	45°	90°	180°	225°	270°	315°
	Bottom		9.0	-5.0	-40	9.0	5.0	- 2.0	6.0
		#2 #3	6.0	5.0	13.0	9.0	13.0	8.0	13.0
			0.0	14.0	15.0	8.0	14.0	1510	13.0
		15	13.0	14.0	15.0	7.0	130	13.0	14.0
					Hole #2		0.1/r	- D:-	Dallaus
	ace Finish rusion, in	-	-	90-95			8101	ng Pin	Korrout
Perp	endiculari	ty,	.001 i					81 101	ه ۱۰ هم میری پ
	Longitudir h Gage Rea			Transver	se 100	35			· 1
	citance Ga	_	-	264		_ (	<		
Exit	Burr Heig	ht,	in			_ 5	)		
3/9/3	23		A		Reading ar Posi	s (.0001 tion_	<u>in.)</u>		
	Axial	T							
	Position		0°	45°	90° ·	180°	225°	270°	315°
	Bottom //		7.0	-9.0	-3.0	5.0		.5.0	4.0
	#		4.0	0	7.0	6.0	0	5.0	50
	#		.0	11.0	14.0	5.0	14.0	14.0	8.0
	Ĭ.		.0	13.0	14.0	7.0	14.0	140	11.0

MA	NUFACTURING RE	PORT: T	APERED I	IOLES								
Test Scries 17 Quality Variable OVALITY Specimen No. 45476												
Hole Manufacturing Conditions and Procedures: TAPERREAN WITH STATEMENT FUNCTIONS SINCE THE PROPERTY OF THE STATEMENT FUNCTIONS SINCE CONTENTS OF THE PROPERTY												
Spindle, rpm Cutting Fluid:	660	Fe	eed:	.00/5 nd. Read	•							
Surface Finish, AA 15-90 Bluing Pin Rollout Protrusion, in. 130 Perpendicularity, .001 in./in.												
Longitudinal <u>I</u> Flush Gage Readir Capacitance Gage Exit Burr Height	Reading 20	72	= 61	Olo		Let 1						
329/204		e Reading ular Posi		1 in.)								
Axial Position	0° 45°	90°	180°	225°	270°	315°						
Bottom #1 #2	-7.0 -4.0 1.0 5.0	-9.0	-7.0	-6.0	-10.0	6.0						
#3	0 10.0	11.0	3.0	11.0	12.0	110						
#5	9.0 13.0	13.0	510	11.0	13.0	13.0						
Surface Finish, A	Α9	Hole #2		Blui	ng Pin I	Rollout						
Perpendicularity, Longitudinal Flush Gage Readin	Protrusion, in. /35 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .0005 Flush Gage Reading, in001 Capacitance Gage Reading 3/0											
Air Gage Readings (.0001 in.)  Angular Position												
Axial Position	0° 45°	90°	180°	225°	270°	315°						
Bottom #1	-8.0 -7.0	-9.0	-9.0	-80	-8.0	-90						
#2 #3	0 60	10.0	3.0	3.0	5.0	4.0						
#4 #5	100	120	3.0	12.0	12.0	10.0						

	M	ANUFACTU	RING RE	PORT:	TAPERED	HOLES					
Test S Specim	eries <u>/7</u> en No. <u>482</u> 1		ity Var	lable	OVALI	TY					
	anufacturing		ons and	Procedu	res. 7	oca B.	0.0 UL	STA			
45.	EAMER FOR	HW.In	TEATER	ENGE.	BACK O	MT STA	AIGHT F	44750			
5p11	Cutting Tapea	660		F	eed:	.00/5					
Cut	ting Fluid:	Der		0	epth: (	Ind. Rea	ding)	1.130			
Hole #1 Surface Finish, AA											
	trusion, in. pendicularity					<del></del>	^	· ×			
i	ongitudinal.	0	Transver		L ,	10%					
Capa	sh Gage Readi ncitance Gage	Reading	7.0	9		1000					
	Burr Height	, in						2.2			
31	8/327	<u> </u>		Reading	gs (.000 ition	1 in.)					
	Axial Position	00	45°	90°	180°	225°	2700	315°			
	ļ	-6.0	-7.0	-9.0	-5.0	-/0.0	10.0	-9.0			
	Bottom #1	0	3.0	1.0	2.2	30	2.0	7.0			
	#3	9.0	8.0	11.0	2.0	60	110	12.0			
	#4	13.0	12.0	13.0	9	10.0	150	13.0			
	#5	13.0	175.0		-1.0	V1.0	175.0	175.0			
				Hole #2							
	ace Finish, A rusion, in.		100-11	0		Blui	ng Pin I	Rollout			
Perp	endicularity,	.001 i			<del></del>		- Prote				
	Longitudinal				<u>ن</u>	./					
	h Gage Readir citance Gage	-	-,00		- 1	DI.					
	Burr Height,	-	282	<u> </u>							
•	1	^	: n Cago	Postina	s (.0001	: \		JE .			
3/	1322	<u> </u>		ar Posi							
	Axial										
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	9.0	-6.0	110	-8.0	-7.0	10.0	6.0			
ļ	#2	7.0	20	10.0	3.0	3.0	7.0	5.0			
	72	3.0	9.0	14.0	4.0	12.0	15.0	11.0			
	#5	5.0	11.0	15.0	6.0	13.0	15:0	13.0			

MANUFACTURING REPORT: TAPERED HOLES												
Test Scries 17 Quality Variable OVALITY Specimen No. 4843C												
Hole Manufacturing Conditions and Procedures: TaperReam North												
SIDE CUTTING TAPER LEANER. MOVE \$ .007 AND PRINCE CUTTO PROMISE CHANGE CHATTE PROMISE CHANGE CHATTE PROMISE CHANGE CHATTE PROMISE CHANGE CHATTE PROMISE CHANGE CHAN												
Spindle, rpm 660 Feed: .0015 Cutting Fluid: Depth: (Ind. Reading) 1.130												
Hole #1 Surface Finish, AA /20./25 Bluing Pin Rollout												
Prot	rusion, in.	12	8		<del></del>	1		10110at				
L	ongitudinal , h Gage Readi	601 1	ransver		<u>}</u>	,06		,				
Capa	citance Gage Burr Height	Reading		0	_ (	, v <b>v</b>						
718/23 Air Gage Readings (.0001 in.)												
21.1	Axial	00		lar Posi		2050	0.700	2150				
	Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2	<u>-9.0</u>	1.0	3.0	1.0	2.0	-9.0	<del>-9.0</del>				
	#3	Ö	40	11.0	2.0	8.0	120	12.0				
	#4	60	11.0	14.0	3.0	13.0	14.0	14.0				
	#5	11.0	12.0	14.0	20	14.0	15.0	14.0				
	5			tole #2		01	01					
	ice Finish, A usion, in.		35.75	10		Blui	ng Pin F	to I fout				
	endicularity,		n./in.					-				
L	ongitudinal.	.001	Transver	se . 00	05	-						
	Gage Readin				<u> </u>	,0%		**				
	itance Gage Burr Height,		28	X	6	,00		. , .				
	11		· · · · · · · · · · · · · · · · · · ·			,						
3/8/3	3/8/3 2 Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	6.0	-6.0	-6.0	- 5° j	-5,0	-8.0	8.0				
	#2	4.0	4.0	4.0	5.1	5.0	5.0	3,0				
	#3	4.0	7.0	11.0	5.6	11.0	13,0	8.0				
1	#4	3.0 40	12.0	15.0	4.0	13.0	140	12.0				
	# J	1.0	, F. V		1.0	75.0	1.0	,				

	М	ANUFACTI	JRING RE	PORT:	TAPERED	HOLES		· · · · · · · · · · · · · · · · · · ·				
Test Series 17 Quality Variable OVALITY												
Specimen No. 40318												
Hole Manufacturing Conditions and Procedures: TAPERREAN WOTH CANAL												
44.	EAMER TON	MIN.I	TEAFER	ENGE.	BACK C	247 ST	BAIBAT	44760				
Spin	<i>Cutting Tapsa</i> ndle, rpm	660	MAYE	£.007	AND PA	·OOI		MANGE OVALA				
	ting Fluid:					Ind. Rea		1.130				
				Hole #1		<del></del>						
Surface Finish, AA 75-100 Bluing Pin Rollout												
	trusion, in. pendicularity		in /in			,						
	ongitudinal			rse . 0	22	106	11	-				
Flus	sh Gage Read	ing, in.	0			i	ar la					
	icitance Gage : Burr Height		9 <u>23</u>	_7		2	<u></u>	4				
						1975		-				
319/	1324		Air Gage	Readin		01 in.)						
	Axial	1			1	7	T	T				
	Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-40	-7.0	-11.0	-3.0	10.0	-20	-7.0				
	#2	5.0	5.0	7.0	5.0	3.0	20	4.0				
	#3	2,0	11.0	13.0	5.0	10.0	13.0	11.0				
	#5	11.0	12.0	12.0	6.0	11.0	11.3	15:0				
				Hole #2								
Surfa	ace Finish,	AA	120.			Blui	ing Pin	Rollout				
	rusion, in.		-									
	endicularity Longitudinal		n./in. Transve	rse 10	015		1	11.				
Flust	h Gage Readi	ng, in.	.00			" مونکرک	•					
	citance Gage		25	2				VI.				
EXIT	Burr Height	, in					, .					
31//32	4	A	ir Gage			1 in.)						
		·	Angu	lar Posi	tion_	<del>,</del>	·	,				
	Axial											
	Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-8.0	-9.0	-6.0	-6.0	-10.0	-7.0	-9.0				
	#2	2.0	0	4.0	2.0	2.0	7.0	2.0				
	#3	3.0	8.0	13.0	5.0	10.0	12.0	9.0				
	#5	9.0	120	12.0	8.0	10.0	11.0	120				

	MA	NUFACTU	RING REF	ORT: T	APERED	HOLES					
Test So	eries /7 en No. 2#//	Qual	ity Vari	able (	DVALI	TY					
ŀ	nufacturing		one and	Procedu	rock T		/// _	574			
Æ	EAMER FOR	MIN. IN	TESTER!	ENGE.	TACK O	UT STA	AIGHT F	24750			
Spin	dle, rpm	660		F	eed:	.0015	-				
Cutt	ing Fluid:	Der		D	epth: (	Ind. Read	ding)	1.130			
Hole #1 Surface Finish, AA /25-/35 Bluing Pin Rollout											
Prot	rusion, in. endicularity	/_	?					7 148			
L.	ongitudinal	0015	ransver		15	55 -		M.			
Capa	h Gage Readi citance Gage	Reading	28	7			*	-			
Exit	Burr Height	·	·			•	•	CANAL STATE			
319/3=	3	A	ir Gage Angu	Reading lar Pos		1 in.)					
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-8.0		- 2.0	9.0	-5.0	-5.0	-8.0			
	#2	7.0	3.0	3.0	0	4.0	13.0	9.0			
	#4	9.0	15.0	13.0	2.0	12.0	13.0	13.0			
		77.0		iole #2	176.62	1410					
	ice Finish, A		85-9			Blui	ng Pin	Rollout			
Perpe	usion, in endicularity,	.001 is									
	ongitudinal Gage Readin				<u>,2</u>	۸					
Capac	itance Gage Burr Height,	Reading	27		<u> </u>	φV • • •		17.00			
3/9/3.	24	A	r Gage Angul	Reading ar Posi	s (.000 tion_	1 in.)	44				
	Axial										
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-8.0	-8.0	-3.0	7.0		-3.0	-5.0			
ŀ	#2	4.0	7. O 3. O	3.0	3.0	11.0	13.0	5.0			
	#4 #5	4.0	13.0	14.0 14.0	7.0	15.0	14.0	12.0			

INSPECTION SHEETS FOR TEST SERIES 18 - EXIT BURRS

Test S	eries <u>/8</u>	Qual	ity Vari	able <u>W</u>	/EXI	- Bu	1 - M	d in	REERE	Ke
Produc Tools: Spindle	e Good Hole U #2 Centerdr	Ising Fo 111; 19 3 -5	llowing /64 in.	Conditio pilot dr	ns: III; Grou Feed		k Drill R	leamer (T	LD2040AR1	
Tool: Spindle Cutting	Good Holes U  France, rpm 3 2  g Fluid: 5 7  ure: REA  WHILE	S CAR	16 <b>1</b> 5 13 501 1302	DRILL VENT HOLE	Feed Dept	: <u> </u>	Reading) ろいまなら	1.40	AULK	
Surf Prot Perp	s: Specime face Finish, trusion, in. pendicularity Longitudinal	AA	8 n./gage Transve	length	Hole #1	-	Bluing	Pin Rol	lout	
Capa	sh Gage Readi acitance Gage t Burr Heigh	ng, In. Reading	]:	111		-	ڔٚۮ	\\ \%		
		A			(.0001 i	<u>n.)</u>				. • •
	Axial	1	Angul	lar Posi	tjan	1	7	7	1	-1
	Position	0°	45°	90°	135°	180°	225°	270°	315°	
	Bottom #1 #2 #3 #4	+!.	+ 1 + 0.5 + 2.5 + 1.5	7 0.5 - 35 - 4.5 - 6.5 - 1.0	105	0 ± 0.5 ± 0.5 ± 0.5 ± 0.5	0 1 · 2 · 0	+ ) : 1 / 1 / 2 / 3	+ 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1	
Prot	ace Finish, A rusion, in. endicularity,	•	1/5	<u> </u>	le #2		Bluing	Pin Roll	<u>out</u>	
Flus Capa	Longitudinal h Gage Readin citance Gage t Burr Height	g, in. Reading	Transve		ا علم: ر		ون في	د د	ļ	
	v			Readings	(.0001 i	n.)		(tr		
-	<del></del>		Angul	ar Posit	ion				<del> </del>	ì
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	Bottom #1	41	+ 1	+!	0	0	ت	+ 0.5	+ 1	
	#2	- 1	11	+1-	0		2	+ 0.5	<del>-</del> -	
-	#3	70.5	10.5	+0.5	+ 05	+25	+ 3,5	± 2.5	+ 0.5	
	#5	+1	71	+ 0.5	0	0	† 0.5	+1	+ 1	

Test Series 18	_ Qual	ity Varia	able $\frac{W}{V}$	EXIT	- BURR	- MIN	INTE	RFERENCE		
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm Cutting Fluid:	111; 19. <b>725</b>	/64 In. s	pilot dr	ill; Group Feed	o 1, Omari :	-0.5	IPM			
Modify Good Holes U Tool: GRUUP 2 Spindle, rpm 3 Cutting Fluid: ST Procedure: REA WHILE	Om S S S S S S S S S S S S S S S S S S S	AKK D D Sol	PILL- LVENT HALE	Feed: Depth	וא	OVERSI	1.4 2 E R	EMER		
Results: Specimen No. 5D67 Hole #1  Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./gage length  Longitudinal 200 Transverse .002/200-  Flush Gage Reading, in. 004  Capacitance Gage Reading: 4/5  Exit Burr Height, in020										
Axial Position  Bottom #1  #2  #3  #4  #5	0° 0 0 + 1 + 1.5		Readings 1 90°  + 0.5  0  0  1 0.5	(.0001 i	180° + 0,5 + 1 + 1 - 0	225° + 6.5 + 1.5 + 2 0	270° + 1 1 1.5 1 2 0 + 1	315°  + / + / + / + / + / - + /5		
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./gage length  Longitudinal <u>coo</u> Transverse <u>coofinch</u> Flush Gage Reading, incoo  Capacitance Gage Reading: 452  Exit Burr Height, incoo										
•••	<u>A</u>	ir Gage f Angul	Readings ar Posit	(.0001 in	<u>1.)</u>					
Axial Position	0°	45°	90°	135°	180°	225°	270°	315°		
Bottom #1 #2 #3 #4	0 0 0	+ 0.5 + 0.5 + 0.5 0 + 1	+ c,5 † 1 † 1 0	+ 0.5 + 0.5 + 1 0	+05	0 0 + 0.5 + 3.5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	© 0 0 2		

W	
Test Series /8 Quality Variable	Ever- Mid. France Mil
	eed: Hens- o.c 10M lepth: (Ind. Reading) 1953
Cutting Fluid: STOCKE SOLVENT DE Procedure:	eed: HAN - 1111A  epth: (Ind. Reading) 1, 390  A AT TAM TO AND FEEL OF THE TOTAL  True of TAM TO AND REALING.  Bluing Pin Rollout
Protrusion, in	<u>\$</u>
Air Gage Readings (.00	)1 in.)
Axial Position 0° 45° 90° 13  Bottom #1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
Surface Finish, AA 22-40 AC 1.  Protrusion, in//9  Perpendicularity, .001 in./gage length  Longitudinal .003/mc/Transverse .000	Bluing Pin Rollout
Flush Gage Reading, in.  Capacitance Gage Reading: 443 / Company  Exit Burr Height, in.	<u></u>
Air Gage Readings (.000 Angular Position	<u>r in.)</u>
Axial Position 0° 45° 90° 135	° 180° 225° 270° 315°
Bottom #1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 10 5 0 0 0
1 45 141 141 141 1 0	

Test Series 18	Quality Vari	able 4	E x	EUFK-	11. N.	INTER-	ERENCE				
Produce Good Hole U Tools: #2 Centerdr Spindle, rpm 32 Cutting Fluid: 572	sing Following ill; 19/64 in.	Condition pilot dr	ns: III; Group Feed	p <b>1, O</b> marl	Corill R	leamer (T	LD2040AR1-				
Modify Good Holes U Tool: GROUP 2 Spindle, rpm 32 Cutting Fluid: ST. Procedure: REAL	SOLAR SOL	RISL I	Feed: Depth	ונים אונים: 1: (Ind.	H DY	1 pm 1.39 ER 21=4					
Results: Specimer Surface Finish, A Protrusion, in. Perpendicularity Longitudinal Flush Gage Readir Capacitance Gage Exit Burr Height	AA <u>25 - 2 / / / / / / / / / / / / / / / / / /</u>	length erse 1007	Hole #1 (/	<b>-</b>		Pin Roll	out	:			
Axial Position Bottom #1 #2 #3		90° + 2.5	135°	180°	225° 	270°  0.5  1  1.5	315° 0 + 0.5 + 0.5	•			
Protrusion, in. Perpendicularity, Longitudinal,	The state of the s										
Flush Gage Readin Capacitance Gage Exit Burr Height	Reading:, in		(.0001 ir	ı.)	65	1/2	¥	-			
Axial Position	0° 45°	90°	135°	180°	225°	270°	315°				
Bottom #1 #2 #3 #4	0 0 0 0 7 0 11 + 0,5	0 +0.5	0 + 0.5 + 7	00000	0 10.5	0 0 0 0 0	0 2 2 0 +1				

Test S	eries <u>18</u>	Qual	ity Vari	able W	EXIT	BURR	- MIN	LATER	LIENCE		
Tools: Spindle	#2 Centerdre, rpm g Fluid: 57	111; 19	/64 in.	pilot dr	īīl; Grou	p 1, 0mar : <u>Hawi</u> h: (ind.	k Drill ( ーン・S' Reading)	Reamer (T	LD2040AR1-5)		
Tool: Spindle Cutting	Good Holes U  GROVY 2  The property of the control	OME 25 00DAK	es De	VENT	Feed Dept	: <u>Han</u> h: (Ind.	- OYL	1.4 R:121			
Surf Prot Perp	s: Specimer ace Finish, A rusion, in. endicularity, Longitudinal	001 i	35 µ A 4 n./gage ATransve	length	Hole #1	-	Bluing	Pin Rol	lout		
Capa	Flush Gage Reading, In										
	Air Gage Readings (.0001 in.)										
	Axial	1	Angul	lar Posis	t ion	7	1	1	<del></del>		
	Position	0°	45°	90°	135°	180°	225°	270°	315°		
	#2 #3 #4 #5	+ 1 + 0.5	+1 + 0.5 + 0.5 + 1.5		+ 0.5 + 0.5 + 0.5 + 0.5	† 0.5 † 2.5 • 0.5 0	† 1 † 1 † 15 2	+ 1 + 1 + 1.5 0 + 0.5	+ 1 + 1 + 1 + 1 + 1 + 1 + 1 + 5		
Surf	ace Finish A	Δ	3 ~		le #2		Bluina	Pin Roll	out		
Perpe l Flust Capac	ace Finish, A rusion, in endicularity, Longitudinal a h Gage Readin citance Gage ! Burr Height	g, in. Reading	Transvei	rse <u>,003</u>	/wcn				1		
23.110	2011 11018			Readings	(.0001 i	n.)			:		
_		<u> </u>	Angul	ar Posit	ion						
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°		
	Bottom #1	+ 0.5	+ 0.5	+ !	- 1	+ 0.5	0	0	+ 0.5		
ļ	#2	+ 0.5	+1	+ !-	+ 1	10.5	Ω	0	+ 0.5		
t	#3	+ 1	4-	+ 1.5	+ 15	1 1 t	·- 0.5	+ 0.5	2,5		
1	#5	+2	+ 2	+1	+ 1	- 0.5	1 0.5	+1	, 1		

Test Series 18 Quality Variable WOLEXIT BURK - MIN INTERFERENCE	į.									
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-! Spindle, rpm 325 Feed: //AND -0.5 I PA1 Cutting Fluid: STODDARD SOLVENT Depth: (Ind. Reading) 1.954										
Modify Good Holes Using Following Conditions:  Tool: GROUP 2 OWARE DRILL REAMER  Spindle, rpm 325 Feed: HAND - 0.5 /PM  Cutting Fluid: STEDDARD SOLVENT Depth: (Ind. Reading) 1,400  Procedure: REAM GOOD HOLE TOUCH UP OVERSIZE REAMER  WHILE NOT ROTALING THEN REAM CEO" DEEPER										
Results: Specimen No. <u>5A57</u> Hole #1 Surface Finish, AA <u>25 Aca</u> Protrusion, in. <u>/2-2</u> Perpendicularity, .001 in./gage length										
Longitudinal ONTINE ransverse OND LINCH  Flush Gage Reading, in. COC Establishment Gage Reading: 457  Exit Burr Height, in. DELUINED										
Air Gage Readings (.0001 in.)  Angular Position  Axial Position  0° 45° 90° 135° 180° 225° 270° 315°  Bottom #1  0										
Surface Finish, AA 30/2 Bluing Pin Rollout Protrusion, in										
Perpendicularity, .001 in./gage length  Longitudinal of myTransverse .004/wc4  Flush Gage Reading, in	-									
Air Gage Readings (.0001 in.)  Angular Position										
Position 0° 45° 90° 135° 180° 225° 270° 315°										
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$										
45 2 0 D + 0' D O C 05										

Test S	eries 18	Qual	ity Vari	able 4	/21-	UKK	-Mics	leser	PENCE	Į-
Tools: Spindl	e Good Hole U  #2 Centerdr e, rpm 3 g Fluid: 57	111; 19. 25	/64 In.	Conditio pilot dr	ns: III; Grou		k Drill f	Reamer (T	LD2040AR1	
Tool: Spindl Cuttin	g Fluid: 5 ure: RLA	OM 5 1000AE	E 506	DRILL VLNT VOLE	Feed Depti	: <i>HAND</i> n: (Ind.	H OVE	1.40 R5121	REAME	K
Sur	s: Specimer face Finish, A trusion, in. pendicularity	AA _	40 MA	η	tole #1	-	Bluing	Pin Roll	out	
Flus Capa	Longitudinal Sh Gage Readir acitance Gage t Burr Height	ng, in. Reading	Transve - <u>00</u> 1:4	erse/		- - -	70	%		; ;
			ir Gage	Readings	(.0001 i	n.)				
	Axial Position Bottom #1 #2 #3 #4	0° + 0.5 + 0.5 + 0.5	45°	90°  0  1 0  1 0  1 0  1 0  1 0  1 0  1 0	135° + 0.5 + 0.5 - 1 1 - 1 1	180°	225° + 0.5 + 1.5 + 2	270° + 0.5 † 1. † 1.5	315° + 0.5 + 1 + 1 Q	
Prot Perp	ace Finish, A rusion, in endicularity, Longitudinal	.001 i	30 ル <i>08</i> n./gage Transve	length	le #2			Pin Roll	out	!
Capa	h Gage Readin citance Gage	g, in. Reading	: -00	91			759	•		1
£X1	t Burr Height		ir Gage I		(.0001 i	1.)				1
•	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°	
	Bottom #1	+1	+1	0	0	+ 0.5	0	+0.5	+1	
-	#2	0	0	0	<u> </u>	0	0	0	0	
	#4	0	0	0	+ 0.5	100	0	-0.5	+ 0.5	

Test Series 18 Quality Variable WO/EXIT BURK -MIN INTERFERENCE										
Produce Good Hole Using Collowing Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-Spindle, rpm 32.5 Feed: HAND -0.5 IPM Cutting Fluid: STODDARD SOLVENT Depth: (Ind. Reading) 1.954										
Modify Good Holes Using Following Conditions:  Tool: GROUP 2 OMARK DRILL REAMER  Spindle, rpm 325 Feed: HAND -0.51PM  Cutting Fluid: STODBARD SOLVENT Depth: (Ind. Reading) 1.400  Procedure: REAM GOOD HOLE, TOUCHUR OVERSIZE REAMER WHILE NOT ROTALING THEN REAM .080" DEEPER										
Results: Specimen No. A Hole #1  Surface Finish, AA 35 MAN.  Protrusion, in. 1/4  Perpendicularity, .001 in./gage length										
Longitudinal Application Transverse 003/1006  Flush Gage Reading, in. 003 70%  Capacitance Gage Reading: 427  Exit Burr Height, in. Dec 1100										
Air Gage Readings (.0001 in.)										
Axial Angular Position										
Position 0° 45° 90° 135° 180° 225° 270° 315°										
Bottom #1 + 1 + 1 0 0 0 + 0.5 + 1 + 1 #2 + 1 + 0.5 0 0 0 + 1 + 1 + 1 #3 + 0.5 0 0 + 0.5 + 0.5 + 1 + 1 + 1 #4 0 0 + 1 + 1.5 + 1.5 + 1 0 0										
<u>#5   + 1   + 1   + 1   + 1   + 0.5   + 0.5  </u>										
Surface Finish, AA 40 km Bluing Pin Rollout Protrusion, in										
Longitudinal occurrent Transverse occurrent Transverse occurrent Transverse occurrent Tool Tool Tool Tool Tool Tool Tool Too										
Exit Burr Height, in. DEBURKED										
Air Gage Readings (.0001 in.)										
Angular Position Axial										
Position 0° 45° 90° 135° 180° 225° 270° 315°										
Bottom #1 +0.5 -0.5 0 0 0 0 0										
#2 + 0.5 + 0.5 + 2.5 + 0.5 0 0 to.5 + 2.5 + 0.5										
#4 2 0 0 105 + 65 0 0 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1										

Test Series 18 Quality Variable WOLEXIT	BUKK	-MIN	INTER	FERENC	Ŀ				
Produce Good Hole Using Following Conditions: Tools: #2 Centerdrill, 19/64 in. pilot drill; Group		Drill F	Reamer (1	TLD2040AR1					
Modify Good Holes Using Following Conditions:  1001: GROUP 2 CHARK DRILL REAME.  Spindle, rpm 325 Feed: Cutting Fluid: STEDDARD SOLVENT Depth: Procedure: REAM GOOD HOLE TOUC WHILE NOT ROTALING THE	<i>tlan'D</i> : (Ind. 	Reading) <u>CVERS</u>	1.70 126 K	CAMER					
Results: Specimen No. 6A6CB Hole #1 Surface Finish, AA 75 11.68 Protrusion, in. 119 Perpendicularity, .001 in./gage length	**************************************	<del></del>	Pin Rol	lout	ľ				
Longitudinal .002/1400 Transverse .010/1404 6356  Flush Gage Reading, in. 1002  Capacitance Gage Reading: 400  Exit Burr Height, in. Difference									
Air Gage Readings (.0001 in Angular Position  Axial Position  0° 45° 90° 135°  Bottom #1 + 0.5 +	180° + 0.5 + 1 + 1	225°  + / + 1.5 + 1.5	270°  ± 1  + 1.5  + 1.5  + 2.5  + 1	315°  + / + /.5  + /.5  + /.5					
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./gage length  Longitudinal		Bluing So:	Pin Roll	out 					
Axiai Axia Axia Axia Axia Axia Axia Axia		2250	2700	315°					
Position 0° 45° 90° 135°  Bottom #1 + 2 + 2 + 2 + /.5  #2 + 2 + /.5 + 2 + 2  #3 + /.5 + /.5 + 2 + 2  #4 + /.5 + /.5 + /.5 + /.5 + /.5	180°  1	225° + ' † ! † !.5	270° + ! + ! + ! + !	+ / + / + / + / + / + / + / + / + / + /					

			IA	10/					
Test Series 18	Qual	ity Varia	able _	/EXIT	BURR	-MIN	LAITER	FERENC	E
Produce Good Hold Tools: #2 Center Spindle, rpm Cutting Fluid:	drill; 19 325	/64 in. ;	oilot dr	III; Grou Feed	p 1, Omar : <u>//A//</u> h: (Ind.	0 -0.5	IPM		-5
Modify Good Holes Tool:GRove Spindle, rpm Cutting Fluid: Procedure:R	325 575000	MARK CD SOL	DRILL VENT HOLE	REAMO Feed Dept	: <u>FlAND</u> h: (Ind.	OVERS	LAC IZE R	CAMER	
Results: Speci Surface Finish Protrusion, in Perpendiculari	, AA	35 // · /3 n./gage	length	lole #1	-	Bluing	Pin Rol	lout	
Longitudinal .604/INCH Transverse _ 000  Flush Gage Reading, in 00   90%  Capacitance Gage Reading: 377  Exit Burr Height, in07 Deciment									
	<u> </u>			(.0001 i	<u>n.)</u>				٠
Axial Position  Bottom # #2 #1	+0.5	45°  + 1 0 -0.5 +0.5 +1	90°  + / + / + / + / + / + /	135°	180°  - b + 1 + 2 + 0.5	225°  0 +45 +2 0	270°  0  1.1  1.5  0	315°  + / + 1 1 0.5 + 0.5 1 0.5	
				le #2		Distan	D:- Dall		
Surface Finish, Protrusion, in. Perpendicularit Longitudina Flush Gage Read Capacitance Gag Exit Burr Heig	y, .001 i 1 <u>000</u> ing, in. e Reading	Transver 01 43	ength se <u>o</u>			70%	Pin Roll	<u>out</u>	
	A	ir Gage R	eadings	(.0001 in	<u>n.)</u>				1
Axial Position	0°	45°	or Posit 90°	135°	180°	225°	270°	315°	
Bottom #1 #2 #3	+1	+1 +1 -1	+ 1. + 1.5 1.1.5. -1.5	+ 0 + 1 + 2 -0.5	0	000-	0 0	+1.5	
#5	12.5	+0.5	+ 05	+ 1	+4.5	+0.5	+0.5	41	

Test Series 18	_ Quality \	ariable _	WEX	- BUR	~ -Mex	. INT	KFLENE		
Produce Good Hole Us Tools: #2 Centerdri Spindle, rpm 32 Cutting Fluid: 57	11; 19/64 i - <i>5</i>	ng Condition. pilot dr	ons: 'III; Grou Feed		k Drill F				
	E CALLLE		Reame, Feed Dept	: HAND h: (Ind. W (Co's	_	49	54		
Results: Specimen Surface Finish, A Protrusion, in. Perpendicularity,	A <u>60</u> 22 <b>5</b> .001 In./g.	Henne age length	Hole #1	- -	Bluing	Pin Rol	lout		
Longitudinal OCS/NENTransverse OOS/NCH  Flush Gage Reading, in. OO3  Capacitance Gage Reading: 404  Exit Burr Height, in. OO8									
		ige Readings		n.)					
Axial Position	0° 45	ngular Posi 5° 90°	135°	180°	225°	270°	315°		
#2 #3 #4	† !	2 -0.5	0	+ / + / 0	+ 1	+ 1	†   †   0 0		
Surface Finish, AA Protrusion, in. Perpendicularity,	. 2 1 2	s in	ole #2	<del>.</del>	Bluing	Pin Rol	lout		
Longitudinal .e. Flush Gage Reading Capacitance Gage R Exit Burr Height,	in eading:	sverse <u>oc</u> 002 442	? <b>6</b>	• •	६०%	ر			
	Air Ga	ge Readings	(.0001 i	n.)			1		
Autal	Ar Ar	igular Posit	ion	1			T1		
Axial Position	0° 45	° 90°	135°	180°	225°	270°	315°		
#2	+0.5 +1	+ /	+0.5 +0.5	+ 0.5	0	0	+ 1		
#4 #5	10.5 to	5. 1.0.5.	+ 1	+ 0.5	0	0	+ 0.5		

Test S	eries <u>18</u>	Qual	ity Vari	able E	XIT B	URR- M	lax. I	NTERFE	ERENCE
Produc Tools: Spindl	e Good Hole U #2 Centerdr e, rpm 3; g Fluid: 5;	sing Fo 111; 19 2.5	llowing ( /64 in. p	Conditio pilot dr	ns: III; Grou Feed	p 1, Omar	k Drili F A-O.S Reading)	Reamer (T	
Tool: Spindle		25 25 2000A	ARK DR	WENT TOLLOW	Feed Dept	: <u>Hand</u> h: (Ind. 060' 7	- 0, 5, Reading)	1.952	
Surf Prot Perp Flus Capa	s: Specimer face Finish, A trusion, in. pendicularity, Longitudinal sh Gage Readinacitance Gage	.001 in	n./gage Transve	length erse 100	3//NCH	MARSED	Bluing	Pin Rol	lout
	Axial		Angul	ar Posi		<u> </u>	<b>T</b>	1	
	Position  Bottom #1  #2  #3  #4  #5	0° +1.5 +1 +1 -1 +10	45° + 2,5 + 2 + 1 - 0 + 10	90° + 3 + 3 + 2 - 0 + 10	135° + 4 + 4.5 - † / 0 + 10	180°  + 4  + 5  + 1  - 0  + 10	225° + 4 + 5 + 0 + 10	270° + 3.5 + 4 0 + 10	315°  + 2 + 325 + / 0
Prot Perp Flus Capa	ace Finish, A rusion, in. endicularity, Longitudinal, h Gage Readin citance Gage i Burr Height	.001 i .001 i 	n./gage Transver 	length rse <u>o</u> o				Pin Roll	out
1	- A. I.a.I	<u>A</u>		Readings ar Posit	(.0001 i	<u>n.)</u>			,
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4	+1 +15 -1 +10	+ 2 + 3 + 1 0 + 10	+ 3 + 4 + 4.5 0 + 10	+ 3 + 4 + 4 + 45 + 40 + 10	+ 3.5 + 4 + 1.5 0 + 10	+ 3 + 4 + 1 - 0 + 10	+ 2.5 + 3 0 0 + 10	+ / + 2 - / 0 + 10

Test Serie	s <u>19</u>	Qual	ity Varia	able 4	e E	IRR - M	ax. da	COSCA"	e) :
Produce Go Tools: #2 Spindle, r Cutting Fl	Centerdr pm 32	111; 19.	/64 in. p	Condition pilot dr	iil; Grou	p 1, Omarl :			LD2040AR1-5)
Modify Goo Tool: <u>Va</u> Spindle, r Cutting Fl Procedure:	pm 32 uid: SI - RELIA	Z OA	24.40	DR .: IENT BLLOW	Feed Dept	h: (Ind.			
Protrusi Perpendi Long	Specimer Finish, A ion, in. icularity, gitudinal, age Readin	.001 I	n./gage Transve	length rse محر	dole #1	-	Bluing	Pin Roll	lout
Capacita	ance Gage rr Height	Reading	: 406			- -	ئى	29'5	
		A	ir Gage	Readings ar Posit		<u>n.)</u>			,
	xial sition	0°	45°	90°	135°	180°	225°	270°	315°
-	#1 #2 #3 #4 #5	+ 1 + 1.5 + 10	- I - I - I.5	† 0.5 † 0.5 † 2.5 † 1 † 10	+ 0.5 1 2.5 0 2 10	0 11 2 0 10	0 -0.5 0 : 9.	+1 +1 0 +2.5 +9.5	+ 1 + 6.5 - 2 + 1 + 10
Surface	Finish, A	A .1	2 4 4	Но	le #2		Bluing	Pin Roll	out
Protmusi Perpendi Long Flush Ga Capacita		.001 i .001 i .000 g, in. Reading	Transver 409	ر <u>ن،</u> rse غ	1 fees		(دن ا		<u> </u>
		A	ir Gage F	Readings ar Posit		n.)			1 "
	xial sition	0°	45°	90°	135°	180°	225°	270°	315°
Во	ttom #1#2	+0.5	0	0 + 2.5	-2	ナンぐ	0.5	2.5	<u>5.5</u>
	#3	+ 0.5 + 2 + 7	+ 0.5	+ 2.5	+7	0 + 7	2 7 7	+7	1 +7

Test Series 18 Quality Variable EXIT BURK - MAX. INTERENCE
Produce Good Hole Using Following Conditions: Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1
Spindle, rpm 325 Feed: HAND - 0.5 IPM
Cutting Fluid: Stories Servent Depth: (Ind. Reading) 1, 905
Modify Good Holes Using Following Conditions:
Spindle, rpm 325 Feed: HAND-0.5-1PM
Cutting Fluid: STORLARD SOLVENT Depth: (Ind. Reading) 1.954
Procedure: REAM HOLE SHALLOW BY ICED" THEN CO'SINK WITH
Results: Specimen No. 2257 Hole #1 (MAFLED END)
Surface Finish, AA 45 4 Bluing Pin Rollout Protrusion, in230
Perpendicularity, .001 in./gage length
Longitudinal <u>000</u> Transverse <u>.007/INCH</u> Flush Gage Reading, in. <u>.002</u>
Capacitance Gage Reading: 326
Exit Burr Height, in. 615
Air Gage Readings (.0001 in.)
Axial Angular Position
Position 0° 45° 90° 135° 180° 225° 270° 315°
Bottom #1 +1 +0.5 0 0 + 0.5 11.5 +1.5
Bottom #1 +1 +0.5 0 0 +0.5 +1.5 +1.5 +1.5 $\frac{12}{0}$ 0 -0.5 0 0 +0.5 +1 +1 +0.5
13 + 0 0 2 0 -1 -0.5 0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
11-1- 40
Surface Finish, AA 45 M m Bluing Pin Rollout
Protrusion, in. , 230
Perpendicularity, .001 in./gage length  Longitudinal ooo Transverse <u>3/rock</u>
Flush Gage Reading, in
Capacitance Gage Réading: 308
Exit Burr Height, in010
Air Gage Readings (.0001 in.) Angular Position
Axial
Position 0° 45° 90° 135° 180° 225° 270° 315°
Bottom #1 +0.5 + 0.5 + 0.5 + 0.5 + 0.5 + 0.5
12 0 0 1 + 1 + 0.5 0 0
14 + 2 + 1.5 0 0 0 1 2
15 +10 +10 :10 +10 +10 +10 +10

Test Se	eries <u>/8</u>	_ Qual	ity Vari	able /_E	XIT E	JER -	MAX	INTER!	GENCE
Produce Tools: Spindle	#2 Centerdr # Fluid: 5 T	sing Fo 111; 19, 325	llowing ( /64 in. p	Condition pilot dr	ns: III; Grou		k Drill R	leamer (T	LD2040AR1-5)
Tool: Spindle Cutting	Good Holes Us  UNDERSIZE  Figure 3 2.5  Fluid: 57  re: ALAM  DALLE	CMA SIDAR HOL	SALV	CILL-RI	Feed Dept	: <u>FIAND</u> h: (Ind. 8Ga Ti			
Surfa Proti Perpo I Flusi Capac	: Speciment ace Finish, A rusion, in. endicularity, Longitudinal and Gage Reading itance Gage	.001 i .001 i .00/ic g, in. Reading	20 n./gage Transve 	length rse <u>, po</u>		M/ 7   	Enr. Bluing	Pin Roll	out !
		A			(.0001 i	<u>n.)</u>			
ı	Axial		Angul	lar Posi	i on	1	1	T	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	#2 #3 #4 #5	0000	- 0.5	0 3 3 3 2.5 1 7	- 9	0 0 -0.5	0 -0 -1 -1 +1	0 -1 -0.5 +9	0 0 -0.5
	ace Finish, A				le #2	•1	Bluing	Pin Rolle	out
Flush Capac	endicularity, ongitudinal, Gage Reading Itance Gage f Burr Height	:04/wc g, in. Reading:	Transve	rse .00.	LINCH		80	70	.
		-	r Gage F	Readings	(.0001 i	n.)			<b>pe</b> .
٢	Axial	*-	Angul	ar Posit	ion	1			
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1	0	0	0	0	0	0	0	0
Ŧ	12	-1		-0.5	0	0	. 0	0	0
+	13	-1	-2.5	-0.5	3	. = 7,	0	0	+1
1	15	+9	+9	+9	10	49	+9	+9	+7

Test Series 18 Quality Variable WEXIT BURK - MEX JATERFERENCE	
Produce Good Hole Using Following Conditions: Tools: #2 Centerdrill; 19/64 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1 Spindle, rpm 325 Feed: HAND-0.5 IPM Depth: (Ind. Reading) 1,9/5	-5)
Modify Good Holes Using Following Conditions:  Tool: UNDERSIZE OMBAK DRILL REAMER  Spindle, rpm 325 Feed: HAND-0,5/PM  Cutting Fluid: STOTOGKD SOLVEDT Depth: (Ind. Reading) 1,454  Procedure: REAM MOLE SHALLOW THEN CO'S/NE WITE  UNDERSIZE REAMER	
Results: Specimen No. 5E46 . Hole #1  Surface Finish, AA 60 # : Bluing Pin Rollout  Protrusion, in. 130  Perpendicularity, .001 in./gage length	<b>.</b>
Longitudinal ODI/INCH Transverse ODI/INCH  Flush Gage Reading, in	. <b>.</b>
Air Gage Readings (.0001 in.)	
Axial Position 0° 45° 90° 135° 180° 225° 270° 315°	
Bottom #1 +0.5	
Surface Finish, AA 35 440 Bluing Pin Rollout Protrusion, in240 Perpendicularity, .001 in./gage length	
Longitudinal CO Transverse CO 3/WCH  Flush Gage Reading, in.  Capacitance Gage Reading: 460  Exit Burr Height, in. DEBURNED	
Air Gage Readings (.0001 in.) Angular Position	
Axial Position 0° 45° 90° 135° 180° 225° 270° 315°	
Bottom #1 $0$ + 0.5 $0$ 0 $-0.5$ $0$ 0 + 0.5 $0$ 0 $0$	k
45	

Test Se	eries <u>18</u>	Qual	ity Vari	able _	19/EX 17	PURK	Max.	INTERF	EKLNIE
Tools: Spindle	Good Hole U #2 Centerdr rpm 32 Fluid: ST	111; 19	/64 in. i	pilot dr	III; Grou Feed	p 1, 0mar : <i>HAND</i> h: (Ind.	-0.51F	M	
Tool: Spindle Cutting	Good Holes U:  VNDERSIZA , rpm 3 Fluid: ST: re: REAM  UNDE	DIARI JALL	SOLV	ENT LLOW	REAME A Feed Dept	: <u>//A///</u> h: (Ind.		1.95	
Surf. Prot Perp	: Specimen ace Finish, A rusion, in. endicularity,	.001 i	55 M 30 n./gage	12 length	Hole #1	_	Bluing	Pin Rol	lout
Fìusi Capa	Longitudinal, h Gage Readin citance Gage Burr Height	<u>∞v//wc/</u> g, in. Reading	Transve . <u>2.0</u> 2.6	rse <u>.00</u>	4/10014	- - -	85%	, 5	:4
		A			(.0001	n.)			
i	Axial	<u> </u>	Angul	ar Posi	tion		1	7	1
	Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1					_			
	#2		·	·}	-			-	
	#4		1						
į	#5	<u> </u>	J	<u> </u>	<u> </u>	1	1	1	
Protr	nce Finish, A rusion, in endicularity,	•	55 M4	<u> </u>	le #2		Bluing	Pin Roll	out
Flush	ongitudinal Gage Readin	.002/140	Transvei	rse ,00 2	1/1NCK		80%		
	itance Gage   Burr Height			RRED		•	,,		
		_			/ 0001 :	1			
		A	Angul	<u>ar Posit</u>	(.0001 i	<u>11. /</u>			
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
1	Bottom #1 #2								
1	#3								
-	#4				<u> </u>	ļ			

wa/	_								
Test Series 18 Quality Variable Exit	BURR-N	AX. INTERFE	KENCE						
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/64 in. pilot drill; Grou Spindle, rpm 325 Feed Cutting Fluid: STORMARN SOLVENT Dept		-0.51PM							
Modify Good Holes Using Following Conditions:  Tool: UNDERSIZE CMARIS DRILL READIL Spindle, rpm 325 Feed Cutting Fluid: STERNARD SOLVENT Dept	: //a ~/ D	-0.5 IPM eading)							
Procedure: REAM HOLE SHALLOW BY L'NDERSIZE REAMER	, (	O'SINK WI	7.H						
Results: Specimen No. 5C/CB Hole #1 Surface Finish, AA 50 Mm. Protrusion, in. , 2/8 Perpendicularity, .001 in./gage length	 	Bluing Pin Roll	lout						
Longitudinal coo Transverse Cot/INCT  Flush Gage Reading, in003  Capacitance Gage Reading: JSO  Exit Burr Height, in. DEBURRED  Air Gage Readings (.0001 in.)									
	n.)								
Axial Position 0° 45° 90° 135°  Bottom #1 + 0.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 -	225° 270° + 0.5 + 1 + 0.5 + 1.5	315°						
#4 +1.5 +1.5 + 0.5	- 0.5	0 + 1	+1						
Surface Finish, AA 50 W Protrusion, in220 Perpendicularity, .001 in./gage length Longitudinal.oc: West Transverse .005//NCH	<u> </u>	Bluing Pin Roll	<u>out</u>						
Flush Gage Reading, in. Capacitance Gage Reading: 405  Exit Burr Height, in.  DEBURE:		764,	2.						
Air Gage Readings (.0001 in Angular Position	<u>)</u>								
Axial Position 0° 45° 90° 135°	180°	225° 270°	315°						
Bottom #1 + 0.5 + 0.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<u>0</u>	0 + 0.5	+ 0.5						
#4 + 0.5 - 0.5 1 1	0	0 0	0						

Test S	eries <u>18</u>	_ Qual	ity Vari	able W	EXIT	BURK -	Max 1	NTEFFE	KEACE
Tools: Spindle	e Good Hole U  #2 Centerdr e, rpm 3 g Fluid: 5-7	111; 19 25	/64 in.	pilot dr	iil; Grou	ip 1, Omar l: <u>Hawo</u> h: (Ind.	k Drill ( - 0.5 Reading)	Reamer (T	LD2040AR1-5)
Tool: Spindle Cutting	Good Holes Us  VNDERST e, rpm 3: g Fluid: ST ure: REAC	ZE C 25 ODDAR M H	MARIE  SD SO	DRILL LVENT MG (LOY	REA/ Feed Dept	: //a// h: (Ind.	Reading)	1.95	4
Surf Prot	s: Specimen face Finish, A crusion, in. pendicularity,	A _ <del>2</del>	2 7 n./gage	length	tole #1	_	Bluing	Pin Roll	<u>lout</u>
Capa	Longitudinal. sh Gage Readin scitance Gage Burr Height	g, in. Reading	: 40	7	2/INCH	- - -	809	2/3	
		A			(.0001	in.)			;
	Axial Position	0°	45°	lar Posi 90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3 #4	0 + 0.5 0 + 1	0 0 +0.5	-0.5 0 -0	0 -0.5	0 0	+ 1 + 1 0 + 0.5	+ 1 + 2 0 + 1	+ / + /.5 0 + /.5
Prot	ace Finish, A/rusion, in.	. 23	-6	ka	le #2	•	Bluing	Pin Roll	out
Flusi Capac	endicularity, Longitudinal h Gage Reading citance Gage F Burr Height,	. <i>005/mc</i> g, in. Reading:	Jransve . 00	rse <u>1000</u>	/INCH	•	£5%		
			r Gage l		(.0001 i	<u>n.)</u>			<b>,</b>
	Axial Position	0°	45°	90°	135°	180°	225°	270°	315°
	Bottom #1 #2 #3	0	†   †   † 0.5	+ 1.5 + 1.5 + 0.5	+1.5 +1.5 +1	+ 1 + 1 + 0.5	000	0	+ /
1	#4	71.5	+ 1,5	+ 1,5	# 1	7-17	0	0	+ 1

Test Series 18 Quality Variable EXIT BURK - MAX. INTEFERENCE
Produce Good Hole Using Following Conditions:  Tools: #2 Centerdrill; 19/54 in. pilot drill; Group 1, Omark Drill Reamer (TLD2040AR1-5)  Spindle, rpm 325 Feed: HAND-O.51PM  Cutting Fluid: Standard Solvent Depth: (Ind. Reading) 1.7/5
Modify Good Holes Using Following Conditions:  Tool: UNDERSIZE OFFACK DRILL REAMER  Spindle, rpm 325 Feed: IFAND - 0.5 IPM  Cutting Fluid: STORMAND SOLVENT Depth: (Ind. Reading) 1.955  Procedure: REAM HOLE SHALLOW, CO'SINK WITH  UNDERSIZE REAMER
Results: Specimen No. 5C28 Hole #1  Surface Finish, AA 40 40 Bluing Pin Rollout  Protrusion, in
Perpendicularity, .001 in./gage length  Longitudinal .006/NCoTransverse .002/NCH  Flush Gage Reading, in003  Capacitance Gage Reading: 347  Exit Burr Height, in. DEFILPED
Air Gage Readings (.0001 in.)
Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°
Bottom #1 + 1 + 1 + 0.5 0 0 + 1 + 1.5 + 1.5 #2 + 1 + 1 + 0.5 0 + 0.5 + 1.5 + 2 + 1.5 #3 + 0.5 + 1 + 0.5 + 1 + 0.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Surface Finish, AA 45 km Bluing Pin Rollout Protrusion, in. 224 Perpendicularity, .001 in./gage length
Longitudinal on franches Transverse of franches  Flush Gage Reading, in.  Capacitance Gage Reading:  Exit Burr Height, in.  DEBURRED
Air Gage Readings (.0001 in.)
Angular Position  Axial Position 0° 45° 90° 135° 180° 225° 270° 315°
Bottom #1 + / + 0.5 + / + / + 0.5 + 0.5 + / + / #2 + / + 0.5 + / + / + / + / + / + / #3

	ма	NUFACTU	RING REP	ORT: T	APERED I	IOLES		
Tost Se Specime	ories <u>1819</u> en No. <u>3641</u>	Qual	ity Vari	able _				
Hole Ma	nufacturing	Conditio	ons and	Procedu	res:			
	idle, rpm ing Fluid:				eed: epth: (1	nd. Read	ting)	
	aco Finish, i	AA	1,2· Z	Hole #1	Program State	Blu	ing Pin	Rollout
Perp	rusion, in. endicularity ongitudinal			50 100	2		,	41 7NA
Flus Capa	h Gage Readii citance Gage	ng, in. Reading	100					
EXIL	Burr Helght	***	ir Gage	Reading	ys (.000	1 (n'.)		**
	Axial	1		ar Pos	505050		1 12	T 1
	Position	0"	45°	90°	180"	225"	2/00	315"
	Bottom #1	60	7.0	-4.0	6.0	-9.0	- 5.0	4.0
	#2	6.0	3.0	5.0	3.8	1.0	4.0	48
	114	5.0	5.0	2.0	20	2.0	3.0	4.0
	#5	50	12.0	60	6.0	70	4.0	2.0
Proti Perpe I	nce Finish, A rusion, in. endicularity, Longitudinal h Gage Readin	.001 i	n./in. Transver			Blui	ng Pin I	Rollout
Capac	citance Gage Burr Height,	Reading in.	365			er= ex	780	
		<u>A</u>	ir Gage Angul	Reading ar Posi	s (.000 tion	<u>1 In.)</u>	T	
	Axial Position	00	45°	90°	180°	225°	270°	315°
	Bottom #1	-80	-70	-10.0	7.0	-9.0	10.0	-7.0
	#3	40	50	6.0	5.0	5.0	40	5.0
	#4 #5	5,0	40	50	40	6.0	5.0	5.0
	<i>F</i> □	9.4	1.0		1	13:1		Y

MAN	UFACTUR	ING REP	ORT: TA	PERED H	OLES				
Test Series 189 Specimen No. 4921		ty Vari	able						
Hole Manufacturing C	onditio	ons and l	Procedur	es:	· · · · · · · · · · · · · · · · · · ·	<del></del>			
Spindle, rpm Cutting Fluid:				ed:	nd. Read	lina)			
catting ridio.				ptii: (i	no. Read	ing) _			
Surface Finish, A		35.37	tole #1	_	Blui	ng Pin	Rollout		
Protrusion, in. Perpendicularity,			***************************************						
Longitudinal	0005T	ransvers		<u>- کو</u>					
Flush Gage Readin Capacitance Gage	Reading		<del> </del>			•			
Exit Burr Height,	in						نعوت رور		
	Air Gage Readings (.0001 in.) Angular Position								
Axial					2050	0.700	2150		
Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2	7.0	-9.0	-10.0	-810	-7.0	-90	-8.0		
#3	3.0	2.0	1.0	3.0	3.0	2.0	3.0		
#4	2.0	40	3.0	50	2.0	1.0	1.0		
#5	30	2.0	3.0	3.0	20	2.0	20		
		ŀ	lole #2						
Surface Finish, A		30 - 31	<b>.</b>		Blui	ng Pin F	Rollout		
Protrusion, in		n./in.	<del></del>						
Longitudinal	1002	Transver	se d				7		
Flush Gage Reading									
Capacitance Gage F Exit Burr Height,		414					ł		
EXIL buil neight,							"; ·		
	A	ir Gage Angul	Reading: ar Posi		in.) -	•	1.		
Axial									
Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1	9.0	-8.0	-90	-7.0	ر. ۴۰	-6.0	-8.0		
#2	30	4.0	0	3.0	2.0	1.0	1.0		
#3	3.0	2.0	-1.0	3.0	5.0	3.0	4.0		
#5	3.0	4.0	0	4.0	3.0	2.0	4.0		

	MA	NUFACTU	RING REP	ORT: T	APERED H	OLES			
Test Se Specime	eries 18 A en No. 2011	Quali	ty Vari	able _					
Hole Ma	nufacturing (	Conditio	ons and	Procedui	res:				
	dle, rpm ing Fluid:				ed: epth: (I	nd. Reac	ling) _		
	Surface Finish, AA Protrusion, in.  Hole #1  Bluing Pin Rollout								
Perp L Flus	Perpendicularity, .001 in./in. Longitudinal 20015 Transverse 2001 Flush Gage Reading, in.								
	Capacitance Gage Reading 364  Exit Burr Height, in.								
		A	ir Gage Angu	Reading lar Posi	s (.000 tion	1 in.).			
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1	-6.0	-4.0	-8.0	-8.0	-7.0	-8.0	-6.C	
	#2	2.0	4.0	3.0	3.0	3.0	3.0	10	
	#4	1.0	3.0	3.0	5.0	2.0	2.0	2.3	
	#5	Ô	2.0	30	5.0	4.0	6.0	0	
Proti Perpe L Flush Capac	Hole #2  Surface Finish, AA 70-80  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal :001  Transverse :0015  Flush Gage Reading, in. :003  Capacitance Gage Reading 395  Exit Burr Height, in.								
	<b>-</b>	<u>A</u>	ir Gage Angul	Reading ar Posi	s (.0001 tion	<u>in.)</u>	,		
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1 #2	-7.0 2.0	<u>-9.0</u>	2.0	-6.0 H.O	-9.0 4.0	4.0	-8,0	
		4.0	5.0	3.0	4.0	5.0	5.0	5-0	
	#4	4.0	40	40	10	3.0	4.0	5.0	
	#5	3.0	4.0	1.0	1.0	4.0	3.0	50	

INSPECTION SHEETS FOR TEST SERIES 19 - COMBINED VARIABLES, DOGBONE STRAP SPECIMENS

	МА	NUFACTU	RING REF	ORT: T	APERED H	IOLES		
Test Se Specime	eries <u>19</u> en No. <u>WA31</u>	Qual	ity Vari	able S	URFOR	- 1Pi	nt	- 12-11
Hole Ma	nufacturing 25.) Pro	Condition	ons and	Procedu	res: <b>A</b>	1211	54.1	
		Diy			eed: epth: (I	nd. Rea	IP17.	2,500
	ace Finish, rusion, in.			Hole #1		Blu	ing Pin	Rollout
Perp L Flus	endicularity ongitudinal h Gage Readi	, .001 i T ng, in.	ransver	3		rt.		
	citance Gage Burr Height	, in					1	
		<u> </u>		Reading lar Pos	s (.000 tion	1 in.)		
	Axial Position	0°	45°	90°	180°	225°	270°	315°
	Bottom #1 #2	-2.0	-4.0 4.0	-50 40	7.0	-9.0 4.0	4.0	-6. U
	#3 #4 #5	3.0 1.0 3.0	2.0	3.0	40	3.0 3.0 5.0	3.0 1.J 4.0	3, 0
				Hole #2				
	ace Finish, A					Blui	ng Pin	Rollout
	rusion, in. endicularity,		n./in.		<del></del>			
ŧ	Longitudinal	1000	Transver	rse .00	L,	1		
	n Gage Readin citance Gage		241	<i></i>	- 70°	b		1-1
	Burr Height,						•1	
		<u>A</u>		Reading lar Posi	s (.0001 tion	l in.)	·	السد ال
	Axial Position	0°	45°	90°	180°	225°	270°	315°
	Bottom #1	-6.0	-4.0	-41.0	-2.0	-5.0	7.0	-6.0
	#2	2.0	3.0	4.0	5.0	4.0	2.0	3.0
	#3 #4	10	0	3.0	3.0	3.0	4.0	2.0
	#5	4.0	4.0	3.0	2.0	3.0	4.0	4.0

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 19 Quality Variable Sullive C Roughous 135/19 Specimen No. 2857C 17. N Total											
Hole Manufacturing Conditions and Procedures: Reging Std Remark											
Spindle, rpm 80 Feed: 5 8 7 PA-1. Cutting Fluid: DIV Depth: (Ind. Reading) 2.500											
Surface Finish, AA 100-105  Protrusion, in. 125  Perpendicularity, .001 in./in.  Longitudinal 1002 Transverse 1001  Flush Gage Reading, in. 1002  Capacitance Gage Reading 299  Exit Burr Height, in.											
Air Gage Readings (.0001 in.). Angular Position											
Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1 -3 0 -3.0 -1.0 -6.0 -10.0 -9.0 -7.0 #2 4.0 5.0 6.0 3.0 2.0 3.0 4.0 #3 3.0 3.0 4.0 2.0 2.0 2.0 4.0 #4 3.0 0 3.0 3.0 2.0 5.0 2.0 #5 12.0 -3.0 3.0 4.0 5.0 12.0 5.0											
Hole #2  Surface Finish, AA /60  Protrusion, in. /05  Perpendicularity, .001 in./in.  Longitudinal / Transverse .003  Flush Gage Reading, in.  Capacitance Gage Reading 345  Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
Axial Pocition 0° 45° 90° 180° 225° 270° 315°											
Bottom #1 - 10.0 - 10.0 - 8.0 - 8.0 - 5.0 - 6.0 - 7.0 #2 3.0 3.0 3.0 1.0 4.0 5.0 4.0 #3 2.0 2.0 2.0 1.0 3.0 - 0 3.0 #4 0 1.0 1.0 0 2.0 1.0 2.0 #5 3.0 4.0 4.0 3.0 3.0 3.0 2.0											

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 19 Quality Variable SURFICE 12 1. ANCIS 12511 Specimen No. 49513 MIN, FUT.										
Hole Manufacturing Conditions and Procedures: 18thus Std. 18thus 18th										
Spindle, rpm 80 Feed: ~ 87.17.16. Cutting Fluid: 10114 Depth: (Ind. Reading) 2.500										
Hole #1  Surface Finish, AA 95 /60  Protrusion, in. 105  Perpendicularity, .001 in./in.  Longitudinal 1000 Transverse 10025  Flush Gage Reading, in. 1002										
Capacitance Gage Ro Exit Burr Height,	eading 34	//			(Ta. 7)					
Axial		ılar Posi		1		James 6.				
Position	0° 45°	90°	180°	225°	270°	315°				
Bottom #1 //	9.0	-8.0	-4.0	-7.0	-8.0	- 810				
#3	0 0	2.0	2.0	2.0	1.0	1.0				
#4 #5	2.0 0 4.0 2.0	-10	0	3.0	3.0	3.0				
Surface Finish, AA Protrusion, in.	120-125	Hole #2		Blui	ng Pin I	Rollout				
Longitudinal	Perpendicularity, .001 in./in.									
	Air Gage Readings (.0001 in.) Angular Position									
Axial Position										
Bottom #1 #2 #3 #3 #4 3	7.0 -100 0 2.0 1.0 3.0	-7.0 2.0 3.0 2.0	-9.0 3.0 3.0	-7.0 4.0 2.0	5.0 3.0 3.0	-7.0 3.0 4.0 3.0				

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 19 Quality Variable Surface Roussmess 125RM Specimen No. 4867 19. N. 1 wt.											
Hole Manufacturing Conditions and Procedures: Ream Std. 198211.ep											
Spindle, rpm 80 Feed: 15 81.17.19. Cutting Fluid: DRY Depth: (Ind. Reading) 2.503											
Surface Finish, AA 90-105 Protrusion, in. //5 Perpendicularity, .001 in./in. Longitudinal 0 Transverse 0 Flush Gage Reading, in002 Capacitance Gage Reading 329 Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1 $-10.0$ $-8.0$ $-8.0$ $-6.0$ $-9.0$ $-7.0$ $-8.$											
Hole #2  Surface Finish, AA /00-//0  Protrusion, in. //0  Perpendicularity, .001 in./in.  Longitudinal _002 Transverse _001  Flush Gage Reading, in.  Capacitance Gage Reading _26  Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1 -7.0 -6.0 -6.0 -8.0 -11.0 -7.0 -7.0 -7.0 #2 4.0 4.0 3.0 1.0 1.0 4.0 3.0 #3 4.0 3.0 1.0 2.0 2.0 3.0 3.0 3.0 #4 2.0 3.0 0 0 1.0 1.0 0 #5 3 0 3.0 2.0 2.0 3.0 3.0 3.0											

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MANUFACTURING REPORT: TAPERED HOLES											
Test Series 19 Quality Variable SURFACE ROMEHMESS 1231Ply Specimen No. 4/157												
Hole Manufacturing Conditions and Procedures: BEAN Std. N.C. 20. 1.625 Reans Mad by H. Sp. RAI Person												
Spindle, rpm 20 Feed: 5 7 7 7 7 Cutting Fluid: DRY Depth: (Ind. Reading)												
	Surface Finish, AA   CO - 120   Bluing Pin Rollout											
Perp L Flus Capa	Protrusion, in. /2/ Perpendicularity, .001 in./in. Longitudinal <u>1601</u> Transverse .002 Flush Gage Reading, in. 002 Capacitance Gage Reading 196 Exit Burr Height, in.											
	Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2	-8.0 3.0	-7.0 3.0	4.0	-4.0 5.0	-7.0 4.0	-8.0	- j. 0				
	#3	4.0	4.0	4.0 5.0 5.0	1.0	4.5	3.6	4.0				
Prote Perpe I Flusi Capac	Hole #2  Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal 1692 Transverse 10015  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.											
		. <u>A</u>	ir Gage Angul	Reading ar Posi	s (.0001 tion	<u>in.)</u>	alon fish	المراجعة المطابقة المساولة				
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2 #3 #4	7.0 7.0 2.0	-6.0 3.0 2.0 2.0	- 4.0 4.0 3.0	-4.0 4.0 4.0 2.0	-70 30 20	-7.0 2.0 2.0	- 7. J 1. O 1. O				
	#5	4.0	4.0	5.0	3.0	30	4.0	3.0				

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES												
Test Series 19 Quality Variable SURFROUGHUESS 125 RMS Specimen No. 40280 MAX INTERFERENCE (0048)  Hole Manufacturing Conditions and Procedures: REAM WITH UNDER-												
Spin	REAMER dle, rpm ing Fluid:	BO BRY		F e	eed:		BIPA					
Surface Finish, AA //0-125  Protrusion, in. 222  Perpendicularity, .001 in./in.  Longitudinal 10015 Transverse 1001  Flush Gage Reading, in. 1001  Capacitance Gage Reading 220  Exit Burr Height, in. 100-250  Air Gage Readings (.0001 in.)												
				lar Posi		1 10.)	<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>					
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-7.0	-7.0	-8.0	-8.0	-8.0	- <i>8.0</i>	-70				
	#3 #4 #5	4.0 3.0 13.0	2.0	5.0	1.0	4.0 2.0	2.0 13.0	3. 0 1. 0 12. 0				
Prote Perpe I Flusi Capac	Hole #2  Surface Finish, AA 100-110  Protrusion, in. 210  Perpendicularity, .001 in./in.  Longitudinal 1001 Transverse .002  Flush Gage Reading, in002  Capacitance Gage Reading 339  Exit Burr Height, in.  Air Gage Readings (.0001 in.)											
	Axial Position	0°	45°	ar Posi	180°	225°	270°	3\5°				
	Bottom #1 #2 #3 #4 #5	-9.0 2.0 3.0 0	-8.0 2.0 3.0 1.0	-7.0 3.0 3.0 1.0 12.0	-7.0 3.0 4.0 0	-6.00 3.0 3.0 1.0 12.0	-/0.0 2.0 3.0 2.0	-10.0 2.0 4.0 2.0				

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 19 Quality Variable Sur Rough WES 125 AMS Specimen No. 3638 MAN. INTERFERENCE (.0048)											
Hole Manufacturing Conditions and Procedures: REAM WITH LADER-  SIZE REAMER (1.755), REAM WITH MOD. L. N. SPIRAL  PACER  Spindle, rpm BO Feed: S 8 IPM  Cutting Fluid: DRY Depth: (Ind. Reading)											
Surface Finish, AA 1/5-/-5  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal 1000 Transverse .001  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.											
Air Gage Readings (.0001 in.)											
Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1 - 7.0 - 7.0 - 7.0 - 8.0 - 7.0 - 7.0 - 6.0  #2 3.0 3.0 3.0 4.0 3.0 3.0											
13 3 0 3.0 40 3.0 40 2.0 2.0 14 20 0 1.0 2.0 4.0 2.0 1.0											
15 120 13 13.0 V3.0 16.0 13.0 VI.O											
Hole #2  Surface Finish, AA #6-/-2 Bluing Pin Rollout  Protrusion, in. 230  Perpendicularity, .001 in./in.  Longitudinal 7 Transverse 7  Flush Gage Reading, in. 201  Capacitance Gage Reading 287  Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
Axial Position 0° 45° 90° 180° 225° 270° 315°											
Bottom #1 - 2.0 -4.0 -5 0 -9.0 -4.0 -5.0											
#3 5.0 6.0 5.0 5.0 5.0 4.0											
15 V2 0 140 140 120 110 15.0 12.0											

Figure 14 - Sample Manufacturing Report: Tapered Holes

	МА	NUFACTU	RING REP	ORT: T	APERED H	IOLES					
Test Se Specime	eries <u>19</u> en No. <u>424</u>	Qual i	ity Vari	able <u>S</u>		MAX. IL		125 RMS			
Spin	nufacturing  REAMER  Idle, rpm  ing Fluid:	Condition (1.75) BO DRY	ons and	FEAM FE	wirk	EAM L	LH	LWOER-			
Hole #1  Surface Finish, AA 105-//5  Protrusion, in. 235  Perpendicularity, .001 in./in.  Longitudinal 100/5 Transverse 1003  Flush Gage Reading, in. 100/1  Capacitance Gage Reading 296  Exit Burr Height, in.  Air Gage Readings (.0001 in.)											
		<u></u>		Reading lar Posi		<u> </u>	: *				
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	4.0 5.0 5.0 13.0	-3.0 43 6.0 5.0	-3.0 11.0 5.0 40 14.0	-8.0 3.0 4.0 5.0 4.0	-90 30 50 50	-5.0 4.0 4.0 2.0 13.0	-6.0 3.0 4.0 4.0 13.0			
Proti Perpe I Flusi Capac	Hole #2 Surface Finish, AA 100 1/6 Protrusion, in. 223 Perpendicularity, .001 in./in. Longitudinal. 0 Transverse .0035 Flush Gage Reading, in. 121 Capacitance Gage Reading 342 Exit Burr Height, in.										
				Reading ar Posi		· · · · · · · · · · · · · · · · · · ·					
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	7.0 4.0 1.0 0	-60 50 30 20 130	2.0 2.0 0 13.0	-8.0 2.0 3.0 1.0 12.0	-90 30 2.0 2.0	-7.0 5.0 3.0 10	4.0 3.0 1.0 1.0			

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Series Specimen No	ル フ <i>ロ</i> コ	15				14,11	TAIT	125/6			
Hole Manufacturing Conditions and Procedures: 131) M 101-11 10048  131-20-11-11-11-11-11-11-11-11-11-11-11-11-11											
Spindle, rpm 80 Feed: 3 8 FDA1 Cutting Fluid: DRY Depth: (Ind. Reading)											
Surface	Surface Finish, AA //0-/25 Bluing Pin Rollout										
Protrusion, in. 2/4 Perpendicularity, .001 in./in. Longitudinal 100/ Transverse 10025 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.											
		<u>A</u>	ir Gage	Reading lar Posi		1 in.)	· · · · · · · · · · · · · · · · · · ·	****			
	xial sition	0°	45°	90°	180°	225°	270°	315°			
Во	#2 #3 #4	-8.0 2.0 3.0	-7.0 3.0 3.0 1.0	-4.0 5.0 3.0 2.0	-6.0 2.0 4.0 2.0	-8.0 3.0 3.0	-7. C 3. C 1. C	-90 3.0 4.0 3.0			
	#5 Finish, A	A <u>]/0</u>		lole #2	<i></i>	Blui	<i>[/2, □</i> ng Pin F	Rollout			
Perpendi Long Flush Ga Capacita	on, in. cularity, itudinal ge Readin nce Gage r Height,	g, in. Reading	Transver	se . <u>00</u> Z		ho .					
	<b>.</b>		ir Gage Angul	Reading: ar Posi	s (.0001 tion	in.)					
	xial sition	0°	45°	90°	180°	225°	270°	315°			
Во	#2 #3 #4 #5	70 0 4.0 5.0 73.0	-8.0 4.0 6.9 15.0	-5.0 6.0 4.0 15.0	-5.0 6.0 5.0 2.0	-5.0 7.0 3.0 3.0	-5.0 8.0 4.0 3.0	- 8, 0 6. 0 5. 0 4. 0			

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES												
Test Series 19 Quality Variable SUPE POUNTINGS 125 A Specimen No. 2008												
Hole Manufacturing Conditions and Procedures: 12000 With Unit 12000 12000 With 12000 With Sport 12000 With 120												
Spindle, rpm 80 Feed: 38 1.18.19. Cutting Fluid: 0.77 Depth: (ind. Reading)												
Surf Prot	Surface Finish, AA 120-125 Bluing Pin Rollout Protrusion, in. 235											
Perp L	endicularity ongitudinal h Gage Readir	, .001 i	n./in. ransver	se <u>, 00</u> ;	- - 1501	lo s	校					
Capa	citance Gage Burr Height	Reading			· ·	- V8.33	۶ ۱۱۰۰ - ۱	重				
		<u>A</u>		Reading lar Posi		1 in.)	Tari, A	101				
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-8.0	-1/c	-3.0 9.0	0	٠/ ر	-3.0	-4.0				
	#2	8.0	\$ . J	50	100	5.0	6.0	10.0				
	#4	4.0	2.0	50	20	5.0	5.0	6.				
	<u> </u>	177.0	173. 0		140	1/5.0						
Prot	ace Finish, A rusion, in endicularity,	228	5-10	lole #2		Blui	ng Pin I	Rollout				
Flusi	Longitudinal, h Gage Readin citance Gage	g, in.	Transver	se <u>, 00</u>	<u>- 8</u> 5	olo						
	Burr Height,						•	. 31				
		<u>A</u>		Reading ar Posi		<u>in.)</u>		4				
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-7.0	-7.0	-5.0	-3	-4.0	-6,0	-6.0				
	#2	5.0	6.0	40	20	7:0 3:0	5.0	5.7				
	#4	40	30	20	5.0	3.0	7.5	3.0				
	#5	1:0	14.0	15.0	120	13.0	140	15:00				

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MANUFACTU	RING REP	ORT: TA	APERED H	OLES					
Test Series 19 Quality Variable Suppose Prougation School Christian No. 418576 19:00 19:00 12517505										
Hole Manufacturing Conditions and Procedures: Plan V, th Visition SIZE Property 1.755. Property 1.755. Property 1.755. Property 1.755. Property 1.755. Property 1.755. Property 1.755. Procedures: Pro										
Surface Finish, AA //0-/20 Protrusion, in. /02 Perpendicularity, .001 in./in. Longitudinal 100/ Transverse / Capacitance Gage Reading 204 Exit Burr Height, in.										
	<u> </u>		Reading lar Posi		1 in.)	0 15.63	ाक, क्र			
Axial Positio	n 0°	45°	90°	180°	225°	270°	315°			
	#1 4.0 #2 9 0 #3 7.0 #4 5.0 #5 4.0	4.0 10.0 9.0 1.0	5. C 11. C 9.0 2.0	4.0 9.0 9.0 5.0 4.0	4.0 9.0 9.0 2.0 5.0	4.0 9.0 9.0 5.0	3.0 9.0 9.0 5.0 4.0			
Protrusion, in Perpendicular Longitudio Flush Gage Rea Capacitance G	Surface Finish, AA /25 Hole #2 Protrusion, in. /3/ Perpendicularity, .001 in./in. Longitudinal .00/ Transverse .00/ Flush Gage Reading, in002 70/ Capacitance Gage Reading 230 Exit Burr Height, in.									
	<u>A</u>		Reading: ar Posi		in.)		. see 1			
Axial Position	n 0° ′	45°	90°	180°	225°	270°	315°			
	71 -2. J 72 6. 3 73 7.0 74 8.0 75 7.0	- 7.0 3.0 4.0 3.0 3.0	-7.0 4.0 4.0 4.0 4.0	-5.0 4.0 5.0 6.0	7.0 5.2 5.2 7.0	-6.0 5.0 6.0	-1.0 7.0 9.0 9.0 9.0			

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES												
	Test Series 19 Quality Variable SURFILE ROUTHWESS SCHOTTER Specimen No. 4858C 17. M. Int. 1257.											
Hole Manufacturing Conditions and Procedures: 1817 with Unitalization LISS Resemble AND Little Spine 1 Resemble												
Spindle, rpm RO Feed: SF F. 7/19/10 Cutting Fluid: DILY Depth: (Ind. Reading) 2,500												
Surf Prot	Hole #1 Surface Finish, AA /00 //0 Bluing Pin Rollout Protrusion, in. /2,1											
Perp L Flus Capa	Perpendicularity, .001 in./in. Longitudinal 10005 Transverse 10015 Flush Gage Reading, in. Capacitance Gage Reading 202 Exit Burr Height, in.											
		A	ir Gage Angu	Reading ar Posi	s (.000 tion	1 in.)		æ ∰.				
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2	80	7.0	4.0	2.0	2.0	-8.0 3.0	2.0				
	#3 #4 #5	9.0 10.0	5.0	4.0 5.0	9.0	10.0	5.0 d.C	9. C 10.0				
Proti Perpe	ace Finish, Arusion, inendicularity,	.001 i	05 F	lole #2		віфі	ng Pin F					
Flus! Capac	Longitudinal h Gage Readin citance Gage Burr Height,	g, in. Reading	_0		<u>re</u> _ 1 <sup>5</sup>	J.		•				
		<u>A</u>		Reading ar Posi	s (.000 tion	1 in.)		dir.				
	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2 #3 #4	0 6.0 7.0 8.0	-5.0 2.0 4.0	-7.0 1. G 2.0 2.0	-50 50 60 20	-1.0 2.0 8.1 5.0	4.C 4.0 4.0	-3.0 5.0 6.0 2.0				
	#5	80	3.0	4.0	6.0	13.0	3.7	60				

Figure 14 - Sample Manufacturing Report: Tapered Holes

	МА	NUFACTU	RING REP	ORT: T	APERED H	OLES				
Test Series 19 Quality Variable SURFICE PLANTAGE SUPERING										
Hole Manufacturing Conditions and Procedures: Blam: With Underg- Size Reduced 1.75. 18 the App. Left. Spinish 18 the Con- USC Boll on the Section 18 the Spinish 18 the Con- Spindle, rpm 50 Feed: 55 K.T. Ap. Cutting Fluid: Ult Depth: (Ind. Reading) 2.500										
Hole #1 Surface Finish, AA /00 Bluing Pin Rollout										
Prot	rusion, in. endicularity	774				<u>Diui</u>	119 1 111	KOTTOUL		
Ĺc	ongitudinal	0015 T		se 100;	75	od	61.14			
Capac	h Gage Readir Citance Gage	Reading	22	7	&	V	·			
Exit	Burr Height,									
		<u>A</u>		Reading lar Posi	s (.000 tion	1 in.)				
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	0	-3.0	-3.0	-1.0	1.0	0	2.0		
	#2	9.0	2.0	5.0	7.0	9.0	9.0	10.0		
	#4 #5	13.0	13.0	7.0	8.0	110	10.0	10.0		
Protr Perpe L Flush Capac	Hole #2 Surface Finish, AA 95-105  Perpendicularity, .001 in./in. Longitudinal 1003 Transverse 005 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.									
_	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2 #3	7.0	5.0	5.6	-3.0	9.	70	-3.0 \$.0		
	#4 #5	9.3	7.0	5.0	5 C	13.0	9.0	7.0		

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES								
Test Series 19 Quality Variable SUNFOCE ROLLINGS SCHOOLS Specimen No. 4EIT 1257000								
Hole Manufacturing Conditions and Procedures: Report With United and Procedures: Repor								
Surface Finish, AA //0-/-3  Protrusion, in. /23  Perpendicularity, .001 in./in.  Longitudinal -00/ Transverse .0005  Flush Gage Reading, in. 100 ~ 217  Exit Burr Height, in.								
Air Gage Readings (.0001 in.) Angular Position								
Axial Position 0° 45° 90° 180° 225° 270° 315°								
Bottom #1 -1.0 -5.0 -5.0 -1.0 1.0 2.0 )  #2 8.0 7.0 40 7.0 8.0 9.0 3.0  #3 10.0 8.0 40 8.6 9. 10.0 10.0 10.0  #4 11.0 90 5.0 90 9.0 11.0 10.0  #5 13.0 13 0 12 0 11 2 10.0 10 2 10.0								
Surface Finish, AA //o-/= Bluing Pin Rollout Protrusion, in. /2/ Perpendicularity, .001 in./in. Longitudinal /00= Transverse .001 Flush Gage Reading, in. Capacitance Gage Reading 222 Exit Burr Height, in.								
Air Gage Readings (.0001 in.) Angular Position								
Axial Position 0° 45° 90° 180° 225° 270° 315°								
Bottom #1 0 -40 -6.0 -2.0 0 2.0 -1.0 #2 9.0 5.0 4.0 5.0 8.0 9.0 7.0 #3 9.0 5.0 3.0 6.0 8.0 9.0 7.0 #4 10 7.0 3.0 7.0 7.0 10.0 9.0 #5 1 7 5.0 14.0 7.0 9.0 10.0 9.0								

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES									
Test Series 19 Quality Variable Superior Rodehamas Superior No. 4/6/8 125/100.									
Hole Manufacturing Conditions and Procedures: Result 1.71 United State 1.755 Results 1.755 Results 1.755 Results 1.755 Results 1.755 Results 1.755 Results 1.755 Results 1.755 Results 1.756 Results 1									
Surface Finish, AA // / / / / / / / / Bluing Pin Rollout Protrusion, in. // / / / / / / / / / Bluing Pin Rollout Perpendicularity, .001 in./in. Longitudinal / Transverse / 002 Flush Gage Reading, in. / 002 Capacitance Gage Reading / 38 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 -3.0 -6.0 -9.6 -3.0 -1.0 -6.0 -2.0 #2 7.0 3.0 3.0 7.0 7.0 6.0 2.0 #3 5.0 4.0 4.0 9.0 9.0 9.0 2.0 #4 9.0 4.0 5.0 10.0 9.0 2.0 #5 8.0 4.0 0.0 10.0 9.0									
Surface Finish, AA / 3 / 4 / 5 / 5 / 5 / 5 / 5 / 5 / 5 / 5 / 5									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 -3.0 -4.0 -3.0 -8.0 -2.0 -6.0 -2.0 #2 6.0 70 80 70 9.0 6.2 2.0 #3 7.0 60 70 70 9.0 6.0 8.0 #4 2.3 -0 6.0 70 70 70 9.0 #5 7.0 5.0 6.0 6.0 10.0 -0 9.0									

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MANUFACTL	IRING REP	ORT: TA	APERED H	OLES						
Test Series 19 Quality Variable Superace Roughwess - Scantch Specimen No. 20313 MAX. Twt. 125 hines											
Hole Manufactur  Size Recipolity  USE Buck of Spindle, rpm Cutting Flui	7 tool 3	5 /7 KM	5 1 p Fe	ed: 1	Spill	121 12: N. 12: 14.	4 119				
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal O Transverse .0025  Flush Gage Reading, in.  Capacitance Gage Reading 224  Exit Burr Height, in.											
	1.	Air Gage	Reading lar Posi		1 in.)	Mar.					
Axial Positi		45°	90°	180°	225°	270°	315°				
Bottom	#1 -3.0 #2 7.0 #3 9.0 #4 /5.0 #5 /0.0	-7.0 4.0 4.0 11.6 13.0	70.0 1.0 1.0 9.0 13.0	-8.0 40 5.0 10.0	-2.0 6.0 9.0 10.0	-3.0 6.0 9.0 11.0	-3. U 8.0 10.0 11.0 12.0				
Protrusion, Perpendicula Longitud Flush Gage R Capacitance	Hole #2 Surface Finish, AA /20/2 Bluing Pin Rollout Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .001 Transverse, .002 Flush Gage Reading, in. Capacitance Gage Reading 220 760 Exit Burr Height, in.										
	<u>!</u>	Air Gage Angul	Reading ar Posi		in.)						
Axial Positio	on 0°	45°	90°	180°	225°	270°	315°				
Bottom	#1 -3.7 #2 7.7 #3 9.0 #4 10.0 #5 11.0	-7.0 5.0 7.0 9.2 11.0	-8.0 4.0 5.0 7.0 12.0	-7.0 3.0 4.0 4.3 13.0	-3.0 8.0 8.0 7.0	-3.0 2.0 2.0 10.0 10.0	-4.0 20 9.0 7.2 11.0				

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Series // Quality Variable Superior Responses Series Specimen No. 4936										
Hole Manufacturing Conditions and Procedures: Richa With Under-										
Surface Finish, AA // Bluing Pin Rollout Protrusion, in. 2.25 Perpendicularity, .001 in./in. Longitudinal 00/5 Transverse 1002 Flush Gage Reading, in. 0 Capacitance Gage Reading 226 Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 C -(6.0 3.0 -1.0 -2.0 -4.6 #2 5.0 4.0 3.0 4.0 6.0 6.0 6.0 #3 9 0 4.0 3.0 7.0 7.0 5.0 6.0 #4 10 0 5.0 3.0 7.0 7.0 12.0 6.0 #5 14.0 12.0 12.0 13.0 9.0 14.0 13.0										
Surface Finish, AA 95 /C Bluing Pin Rollout Protrusion, in. Perpendicularity, .001 in./in. Longitudinal 0 Transverse 002 Flush Gage Reading, in. Capacitance Gage Reading 244 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -2.0 -5.0 -6.0 -5.0 -2.0 -6.0 -5.2 #2 6.0 4.0 4.0 3.0 6.0 4.0 5.2 #3 8.0 6.0 4.0 4.0 8.0 5.0 6.0 #4 9.0 6. 4.0 3.0 7.0 4.0 7.6 #5 140 1.0 1.0 1.0 - 140 140										

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MA	NUFACTUE	ING REP	ORT: T	APERED H	OLES			
	Test Series 19 Quality Variable SunFACE Rough we 55-500-4 n Specimen No. 4058								
<i>ير يخ</i> // <i>ير يخ</i> Spin	Hole Manufacturing Conditions and Procedures: Renar With United Size Reported 1.755 Renam 1900 F. H. S.D. 1111 Procedures  Spindle, rpm 80 Feed: 3 8 7 7 11  Cutting Fluid: 013 V Depth: (Ind. Reading) 2 400								
Surface Finish, AA /c /2 Bluing Pin Rollout Protrusion, in. 222 Perpendicularity, .001 in./in. Longitudinal .001 Transverse 1003 Flush Gage Reading, in. 0 Capacitance Gage Reading 215 Exit Burr Height, in.									
		<u>A</u>	ir Gage	Reading ar Posi		1 in.)		** 4. 5.	
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	#2 #3 #4 #5	3.0 11.0 13.0 15.0	5. C 6. C 7. C	-1.0 40 5:0 60	9.0 9.0 10.3	5.0 10.0 11.0 11.0	80	3. C 1C. C 11. 0 12. U	
Prot Perp	ace Finish, A rusion, in. endicularity, Longitudinal	.001 i	n./in. Transver		<u>.</u>	Blúi	ng Pin f	Rollout	
Capa	Flush Gage Reading, in. Capacitance Gage Reading  Exit Burr Height, in.  Air Gage Readings (.0001 in.)								
	Axial		Angul	ar Posi	tion				
	Position	0°	45°	90°	180°	225°	270°	315°	
	#2 #3 #4 #5	1.0 10.0 10.1 14.0	-3.0 7.0 6.0 8.0	3.0	0 8.0 9.0 10.0	30 100 11.0 11.0	3.0 11.0 11.0 13.0	2.0 11.5 15.5	

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 19 Quality Variable Surrace R Concess Subtin										
Hole Manufacturing Conditions and Procedures: Procedur										
Hole #1 Surface Finish, AA 100 110										
Protrusi Perpendi Longi Flush Ga Capacita	Protrusion, in. 230  Perpendicularity, .001 in./in.  Longitudinal Control Transverse .0015  Flush Gage Reading, in. 001  Capacitance Gage Reading 205									
Exit Bur	r Height.	_					1 ofum.	The same of		
		<u>A</u>	ir Gage Angu	Reading lar Posi		1 in.)				
	xial sition	0°	45°	90°	180°	225°	270°	315°		
Во	ttom #1 #2	30	-20	10.0	-5.0	3. C	1/ 1	-5.0		
	#3	8.0 9.1	4.0		5.0	4.0	4	6.5		
	#4	10 0	13.0	30	12.0	140	7.	110		
Surface I Protrusio Perpendio	on, in. cularity,	.001 ii	<i>⊃-/25</i> <u>2</u> n./in.	<del> </del>		Blui	ng Pin F	Rollout		
Long Flush Gag Capacitan Exit Burn	nce Gage	g, in. Reading	.0:1	se , <u>ac</u>	<u> </u>	olo		*		
		<u>A</u>	ir Gage Angul	Reading ar Posi		in.)		4.		
	cial sition	0°	45°	90°	180°	225°	270°	315°		
Bot	tom #1 #2 #3 #4	-4.0 -7.9 -7.2	-7.9 1.0 1.0 (.0	-6.3 1.0 2.3 2.3	-3.0 \$.0 8.0 2.0 10.0	3.7 6.0 8.0 8.0	-11.0 2.0 4.0 4.0	-3.0 5.0 7.0 8.0 9.0		

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MA	NUFACTU	RING REP	ORT: T	APERED I	IOLES					
Test Series 19 Quality Variable Suit The Respective As Specimen No. 2E113 Quality Variable Suit The Respective As Series As Se											
تعشد	Hole Manufacturing Conditions and Procedures: 100 100 100 100 100 100 100 100 100 10										
Spindle, rpm  Cutting Fluid: Line  Depth: (Ind. Reading) 2403											
Surface Finish, AA 105-120 Bluing Pin Rollout											
Perp Lo Flus Capa	Protrusion, in. 22/ Perpendicularity, .001 in./in.  Longitudinal O Transverse .003  Flush Gage Reading, in0000  Capacitance Gage Reading 2/0  Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
	Axial	_		lar Pos			T	·			
	Position	0°	45°	90°	180°	225°	270°	315°			
	#2 #3 #4 #5	-4.0 5.0 8.0 11.0	-10.0 0 2 J 11 0	-90 -10 0	5,0 5,0 2,0 2,0	7.0	10.0	-3. C 7. O 10 g			
······		170.0		1/2.0			177.9	<i>V</i> (			
	ace Finish,	AA 10	0-110	dole #2	_	Blui	ng Pin I	Rollout			
Perpe	rusion, in. endicularity,	-			<u> </u>						
Flush Capac	ongitudinal n Gage Readir citance Gage Burr Height,	ng, in. Reading	100   235	'se <u>. 0</u>	<u> </u>	to		3			
		A	ir Gage Angul	Reading ar Posi		1 in.)		94 27 18 28 249			
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2	-2.7	-5.0	-5.0	-3.0	-30	3.0	-3.0			
	#3 #4	8.0	7	3.0	20	8.0	4.0	9.0			
	#5	13.0	150	12.7	13.0	10.0	11.0	(c. )			

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES									
Test Series 19 Quality Variable Supplied 19 19 19 19 19 19 19 Specimen No. 4F4T 1910 1910 1910 1910 1910 1910 1910 191									
Hole Manufacturing Conditions and Procedures: Beam With Under-  SIZE FORMER IN BEAM NOW LIH POWER IN THE PROPERTY OF Spindle, rpm 80 Feed: J. 8 T. Ph.)  Cutting Fluid: DP/ Depth: (Ind. Reading) 2,500									
Surface Finish, AA 100-105  Protrusion, in. 121  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse .0005  Flush Gage Reading, in. 0  Capacitance Gage Reading 176  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 -140 -14.0 -15.0 -12.0 -13.0 -14.0 -14.0 #2 2.0 2.0 5.0 3.0 1.0 2.0 2.0 #3 3.0 3.0 3.0 4.0 2.3 5.0 3.0 #4 3.0 2.0 2.3 3.0 1.0 4.0 1.0 #5 2.0 2.0 3.0 4.0 2.3 4.0 2.3									
Surface Finish, AA 95-110  Protrusion, in. 1/6  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse .0015  Flush Gage Reading, in.  Capacitance Gage Reading 312  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 - 14.0 - 15.0 - 12.0 - 14.0 - 14.0 - 16.0 - 17.0									

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MANUFACTURING REPORT: TAPERED HOLES										
Test Series 19 Quality Variable Surface Rough wiss - Rifling Specimen No. 2068 1910, 2 mt. 125815											
Hole Manufacturing Conditions and Procedures: PRAY WITH UNDER- SIZE REAMEN 1.755 REAM AGOD L.H. Spirel REAMENTER USE MOD. L. H. Spirel Reament Nushing 400.500 No Riply Spindle, rpm RO Feed: Sp. 1 pag. Cutting Fluid: DRY Depth: (Ind. Reading) 2 500											
Hole #1											
	ace Finish, /		1-120			Blui	ng Pin	Rollout			
Perp Le Flus	Protrusion, in. 109 Perpendicularity, .001 in./in. Longitudinal 10005 Transverse 1001 Flush Gage Reading, in. 0 Capacitance Gage Reading 275										
	Burr Height,					į	:				
		<u>A</u>		Reading		1 in.)					
	Axial			lar Posi		<u> </u>	1	<u> </u>			
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-12.0	-140	15.0	-13.0	13.0	-12.0	-			
	#2	3.0	3.0	2.0	3.0	3.0	3.0	2.0			
	#4	40	3.0	4.0	3.0	30	3.0	1.0			
	#5	40	4.0	14.0	3.0	3.0	4.0	2.0			
Proti Perpe l Flush Capac	Surface Finish, AA 106-105 Protrusion, in. 1/5 Perpendicularity, .001 in./in. Longitudinal 1002 Transverse 1002 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.										
		<u>A</u>		Reading ar Posi		<u>in.)</u>	!				
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-//.0	-13.0	-/3.0	-14.0	-/2.0	-12.0	-11.0			
	#2	3.0	1.0	1.0	1.0	3.0	4.0	4.0			
	#4	4.0	20	-1.0	3.0	3.0	20	3.0			
	#5	4.0	2.0	0	2.0	3.0	4.0	3.0			

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MA	NUFACTUR	RING REP	ORT: T	APERED H	IOLES				
Test Se Specime	Specimen No. 4013 Quality Variable Suriant Southwest Riving									
ري <i>اعلان</i> Spin	Hole Manufacturing Conditions and Procedures: Rep. 1816 United Size Between 1855 Penns No. 1866 1867 Penns No. 1866 1867 Penns No. 1866 1867 Penns No. 1866									
Surface Finish, AA /00-105 Protrusion, in. //6 Perpendicularity, .001 in./in. Longitudinal C Transverse .cc/ Flush Gage Reading, in. ,cc/ Capacitance Gage Reading 304 Exit Burr Height, in.										
		<u>A</u>		Reading ar Posi		1 in.)	:	had 2		
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	#2 #3 #4 #5	-15.0 2.0 1.0 1.0 2.0	- 2.0 1.0 2.0 3.0	140 40 3.0 40 3.0	15.0 3.0 3.0 2.0 3.0	-/2.0 3.0 4.0 3.0 3.0	-12 0 2.0 3.0 1.0 3.0	15.0 2.0 2.0 1.0 3.0		
Prot Perpo Flus Capa	Surface Finish, AA /20-/25 Bluing Pin Rollout Protrusion, in. /20 Perpendicularity, .001 in./in. Longitudinal 1605 Transverse .0015 Flush Gage Reading, in002 Capacitance Gage Reading 216 Exit Burr Height, in.									
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2 #3 #4 #5	9.0 4.0 5.0 4.0 4.0	-12.0 3.0 3.0 3.0	-120 2.0 3.0 3.0	-13.0 2.0 2.0 2.0 2.0 4.0	- 8.0 4.0 4.0 5.0	-9.0 3.0 3.0 1.0 3.6	12.0 3.0 4.0 3.0 3.0		

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MA	NUFACTU	RING REP	ORT: TA	APERED H	OLES		<del></del>	
Test Series 19 Quality Variable SURFACE BOUNDES. B. Fling Specimen No. 4017 Now, FM. 125 RAS.									
Hole Manufacturing Conditions and Procedures: Ream With Under- Size Repair 1.75. Ream Agab Litt. Spiage Repair of USC 1900 Litt. Sp. 1801 18 A TOTAL 1845 - 400 560 No. 1811									
Spindle, rpm 80 Feed: - Feed:									
Surface Finish, AA 100-110 Bluing Pin Rollout Protrusion, in. 108									
Perp L	endicularity ongitudinal	, .001 i	n./in. ransver:	se <u>, 00 /</u>	— — 70°	to	gram, plaka i	A service of the serv	
Capa	h Gage Readin citance Gage	Reading			_ 70	•		*	
LAIL	Exit Burr Height, in.  Air Gage Readings (.0001 in.)								
	Axial	<del> </del>	Angu	lar Posi	tion	Υ	т		
	Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1	14.0	-14.0	-14.0	-14.0	-12.0	15.0	14.0	
	#2	1.0	2.0	3.0	3.0	30	3.0	3.	
	#4	1.0	2.0	6.0	1.0	0	1.0	2	
	#5	20	2.0	3.0	2.C	1.0	3.0	2.0	
	ace Finish, A		_	lole #2		Blui	ng Pin R	lollout	
Perp	endicularity,	.001 i	n./in.						
	Longitudinal h Gage Readir			_	<u>~</u>	1	,	- 4 1	
	citance Gage		28	8	<u> </u>	> W	=	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Exit	Burr Height,	in						3	
		А	ir Gage	Reading	s (.0001	in.)		1	
				ar Posi				-3	
	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1	13.0	-/3.0	-14.0	14.0	-12.0	11.0	-/3.)	
	#2	20	2.0	3.0	3.0	3.0	4.0	5.0	
	#4	3.0		4.6	2.3	2.0	2.6	3.0	
	#5	3.0	4.0	4.0	2.9	2.0	3.0	4.0	

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
	Test Series 19 Quality Variable SURFFICE ROUTANESS- RIFLING M.N. INT. 125 RMS										
Hole Manufacturing Conditions and Procedures: REAM WITH UNDERSITE REAMINE 1755 REAM MODELLE SPIRAL REAMINE USE MODELLE SPIRAL REAMINE PUSE TO MORPH.  Spindle, rpm 20 Feed: J. RIPM.  Cutting Fluid: DRy Depth: (Ind. Reading) 2.500											
Surface Finish, AA /20-/25  Protrusion, in. /22  Perpendicularity, .001 in./in.  Longitudinal O Transverse .001  Flush Gage Reading, in001  Capacitance Gage Reading 287											
Exit Burr Height, in.											
1	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2	-140	-15.0	11.0	-14.0	-15.0	10.0	-140			
	#3	3.0	3.0	50	4.0	3.0	6.0	3.0			
	#5	3.0	3.0	3.0	3.0	3.0	40	7.0			
Proti Perpo I Flusi Capac	Hole #2  Surface Finish, AA /25 33 Bluing Pin Rollout  Protrusion, in. //8  Perpendicularity, .001 in./in.  Longitudinal O Transverse .001  Flush Gage Reading, in. /// 269  Exit Burr Height, in.										
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
	ries <u>/9</u> n No. <u>284/</u>	Quali	ty Vari	able Su	AT. IN	Raux T. 125	19415	HiFliry		
<u> </u>	Hole Manufacturing Conditions and Procedures: RCHA: With Virders-  SIZE REMOVED 1.755 IREA IEO. L.H. Spirit IREACER  USC 11.0.6.H. Sp. 12.1 Report PUSh Vee: Sep No RIPM  Spindle, rpm 80 Feed: SF.P. No.  Cutting Fluid: DRY Depth: (Ind. Reading) 2.400									
Surface Finish, AA 100-110  Protrusion, in. 210  Perpendicularity, .001 in./in.  Longitudinal 1112 Transverse 10015  Flush Gage Reading, in002 70  Capacitance Gage Reading 294  Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
Angular Position Axial										
	Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	-15.0 30 30 3.0 11.0	-15.0 3.0 2.0 2.0 8.0	-14 0 3 0 4 0 4 0 10 0	-13.0 2.0 3.0 1.0 8.0	-10. c 3.0 3. C 2.0 8.0	-12.0 3.0 2.0 2.0 9.0	-14.0 4.0 3.0 2.0 10.0		
Proti Perpe l Flush Capac	Surface Finish, AA /25 -/35 Bluing Pin Rollout Protrusion, in. 2/2 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .0005 70% Flush Gage Reading, in. 1001 Capacitance Gage Reading 265 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 -/2.0 -/3.0 -/2.0 -8.0 -/0.0 -/0.1 -/4.0 #2 3.0 2.0 3.0 3.0 3.0 4.0 3.0 #3 4.0 5.0 6.0 2.0 3.0 5.0 4.0 #4 5.0 5.0 5.0 1.0 3.0 3.0 4.0 #5 /2.0 /2.0 /0.0 /0.0 9.0 /0.0 /0.0									

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
	ries <u>/9</u> n No. <u>273/</u>	Quali	ity Vari	able S	BRENCE V.A.S	18:2-	bress.	12.14.			
<u> </u>	Hole Manufacturing Conditions and Procedures: RIFF: With Unition  Size Representation Representation For the Strain Report  USE MOD. L.H. SONNEL REPORTED PUSH-IN YOUR NO REPORT  Spindle, rpm FC Feed: STRAIN PROCEDURE Cutting Fluid: Depth: (Ind. Reading) 2,400										
Perp Lo Flusi Capa	Surface Finish, AA //0-120 Protrusion, in. 2/1 Perpendicularity, .001 in./in. Longitudinal 10015 Transverse 0 Flush Gage Reading, in001 Capacitance Gage Reading 291 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2 #3 #4	-12.0 5.0 4.0 3.0	-12.0 3.0 4.0 4.0 11.0	1: 0 3:0 4:5 5:3	-10.C 2.0 3.0 3.0	-8.0 3.0 5.0 4.0 //.0	10 5 4.0 5.0 5.0 12.0	-1:0 4.0 4.0 3.0			
Prote Perpe l Flush Capac	Surface Finish, AA 95-116 Protrusion, in. 217 Perpendicularity, .001 in./in. Longitudinal 0 Transverse 1 Flush Gage Reading, in00 - 288 Exit Burr Height, in.										
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 -13.0 -14.0 -9.0 -14.0 -13.0 -13.0 -13.7  #2 3.0 3.0 5.0 5.0 3.0 7.0 3.0 3.0  #3 3.0 2.0 4.0 3.2 3.0 3.0 3.0  #4 3.0 1.0 2.0 1.0 3.0 4.0 3.7  #5 10.0 10.0 10.0 × 3 9.3 10.0 13.0										

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>/9</u> en No. <u>202</u> /	Qual	ity Vari	able 50	INFACTOR	Rough	11110	2:11-7		
Hole Manufacturing Conditions and Procedures: 18(A) W. H. U. JER- SIZE 1844-61 1.25 1844 MOD L.H. SR. RAI REDITER USE A: 10. L.H. SD. RAI REDITER DU DE 40501 NO 18 PON Spindle, rpm 80 Feed: 5 P. J. P. P. Cutting Fluid: 012 Depth: (Ind. Reading) 2.400										
Hole #1										
Surface Finish, AA 1/6/20 Bluing Pin Rollout Protrusion, in. 2/6										
Perpendicularity, .001 in./in. Longitudinal .001 Transverse 0 Flush Gage Reading, in. 0										
	Capacitance Gage Reading 290 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1	-8.0	-9.0	- 9.0	10.0	-70	-9.0	-90		
	#2	3.0	2.0	3.0	3.0	4.0	3.0	5.0		
	#4	10.0	2.0	4.0	3.0	40	9.0	1.0		
		170.0	10.0		1 8.0	10.0	17.0	70.0		
Proti	ace Finish, F	211	3-12	Hole #2		Blui	ng Pin I	Rollout		
l	endicularity, ongitudinal	1032		rse 100	15	1		· ·		
	n Gage Readir citance Gage		,001 311		_ 10	olo .		,		
	Burr Height,					•		` \		
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-13.0	-14.0	-14.0	15.0	-14.0	-14.0	-15.0		
	#2 3.0 2.0 3.0 2.0 4.0 4.0 3.6 #3 3.0 3.3 3.0 2.0 4.0 4.6 3.6									
	#4	2.0	3.0	1.0	1.0	4.0	3.0	3.0		
	#5	9.0	10.0	4.0	7.0	10.1	5.0	12.0		

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries /9 n No. <u>3C/B</u>	Quali	ty Vari	able 50	BAR F	Roug WT.	25 RM	RiFling		
Hole Manufacturing Conditions and Procedures:										
Surface Finish, AA /20-125 Protrusion, in. 2/2 Perpendicularity, .001 in./in. Longitudinal .00/5 Transverse .002 Flush Gage Reading, in002 Capacitance Gage Reading 20/ Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2 #3 #4	-13 0 5.0 4.0 3 0	-14.0 2.6 3.0 3.0	-13.0 3.0 5.0 4.0	-//.0 5.0 4.0 4.0	-//.0 4.0 4.0	10.0 4.0 2.0 16.0	-12.0 5.0 4.0 3.0		
	#5	10.0	11.0	11.0	8.0	ن بند	13.0	11.0		
Protr Perpe L Flush Capac	Surface Finish, AA //o //20 Protrusion, in. 205 Perpendicularity, .001 in./in. Longitudinal .06/5 Transverse .002 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.									
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 3									
	Position 0° 45° 90° 180° 225° 270°  Bottom #1 -/3.0 -//.0 -/4.0 -/2.0 -/3.0 -/0.0  #2 2.0 3.0 3.0 3.0 4.0 4.0  #3 3.0 3.0 \$0 4.0 4.0 4.0  #4 /.0 3.0 4.0 4.0 4.0  #5 /0.0 //.0 9.0 5.0 /3.0 //.2									

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
	Specimen No. 2 AIT Quality Variable Sulffer Roughage - Rifling MAX. 7 M. 1:5 P. 5										
5 <u>,26</u> 25e Spin	Hole Manufacturing Conditions and Procedures: Repri With Under-  SIZE REPART 1755 REAM END LITE SPICE BERNER  USE MOD LITE SPICE PER PROCEDURE WAS SON NO 12 12 15.  Spindle, rpm RO Feed: SS R IP 11  Cutting Fluid: DRY Depth: (Ind. Reading) 2 400										
Surface Finish, AA 125 Protrusion, in. 218 Perpendicularity, .001 in./in. Longitudinal .002 Transverse 0 Flush Gage Reading, in. 0 Capacitance Gage Reading 295 Exit Burr Height, in.											
Air Gage Readings (.0001 in.)											
	Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2 #3 #4	-140 2.0 4.0 4.0	-13.0 2.0 3.0 1.0	3.0 4.0 2.0	-12.0 3.0 1.0 3.0	-13 J 3.6	-10.0 3.0 4.0 3.0	-12.0 30 40 30			
	#5	9.0	11.0	10.0	11 0	10.0	13.0	8.0			
Protr Perpe l Flush Capac	Surface Finish, AA /00-1/0 Bluing Pin Rollout Protrusion, in. 205 Perpendicularity, .001 in./in. Longitudinal .00/5 Transverse Flush Gage Reading, in00/ Capacitance Gage Reading .338 Exit Burr Height, in.										
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 - 150 150 - 140 - 140 - 140 - 150  #2 20 20 20 20 20 20 20 20 20 20 20 20 20										

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries <u>/9</u> en No. <u>4637</u>	Qual	ity Vari	able Si	VRFP SE	1200y	18 PM	010:00		
Hole Manufacturing Conditions and Procedures: ALL UNCOLUMN SEL SEL SIE SIE FLORE PROCEDURES: ALL SEL DES Spindle, rpm 80 Feed: SEL DES Depth: (Ind. Reading) 2500										
Prot Perp L Flus Capa	Surface Finish, AA   OO   Bluing Pin Rollout   Protrusion, in.   125   Perpendicularity, .001 in./in.   Longitudinal 100/5   Transverse 100/5   Flush Gage Reading, in.   O   Capacitance Gage Reading   172   Exit Burr Height, in.   Air Gage Readings (.0001 in.)   Angular Position									
1:	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	-10.3 3.0 3.0 7.0 7.0	71.0 40 5.0 8.0 10.0	-11.0 4.0 4.0 1.0	-6.0 2.0 6.0 7.0	-5.0 2.0 3.0 11.0	5. C 9. O 12. J 11. O	5 G G.J J.J II-0		
Protr Perpe L Flush Capac	Surface Finish, AA /66 /25 Bluing Pin Rollout Protrusion, in. //O Perpendicularity, .001 in./in. Longitudinal 10005 Transverse 1002 Flush Gage Reading, in01 Capacitance Gage Reading 179 Exit Burr Height, in.									
32%		<u>A</u>	ir Gage Angul	Reading ar Posi		<u>in.)</u>				
,	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	#2 #3 #4	-90 62 50	9.0	-1:0 5:0 7:0 7:0 7:0	-11.0 4.0 5.0 5.0	-1/2 5.6 9.0	11.0 4.0 11.0	-9.0 5.0 5.0 7.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>/9</u> en No. <u>4/E5</u>	Qual	ity Vari	able SA	UPPART DIM. FI	·10:12	. NIS - 6	VELLEX		
η <u>εμ).</u> ς+ <u>μ</u> , ε Spin	Hole Manufacturing Conditions and Procedures: REAL MINISTERS ASSESSMENT ASSES									
Surface Finish, AA 160-13  Protrusion, in. 121  Perpendicularity, .001 in./in.  Longitudinal 1001 Transverse 0  Flush Gage Reading, in. 0  Capacitance Gage Reading 255  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
319	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	-9.0 5.0 8.0	-16 0 3.0 10 0 13.0 10.0	5.0 13.0 10.0	5.0 2.0 8.0 7.0	-5.c 7.0 9.0 10.0 11.0	-7. C 4. C 11. O 12. C 12. O	-8.0 7.0 7.0 16.0		
	ace Finish, A			iole #2	_	<u>Blui</u>	ng Pin I	Rollout		
Flush Capac	endicularity, Longitudinal n Gage Readin citance Gage Burr Height,	g, in. Reading	Transver	'se 1 <u>00</u>		; to		4		
3-1		<u>A</u>	ir Gage Angul	Reading ar Posi		in.)				
<i>5</i>	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	-9.) 5.)	-10.0 5.1	-11.0	-91 5.2	-90	-100	-100		
	#3 #4 #5	7.0	90	7.	3.7	5.0 7.0 9.2	11.0	7.0 6.0 3.3		

	М	ANUFACTUI	RING REP	ORT: T	APERED I	IOLES				
Test Se Specime	eries <u>/9</u> en No. <b>2</b> (2)	Qual	ity Vari	able \$4	M. J.	-11.11.	5 AV -	://-:;-		
Hole Manufacturing Conditions and Procedures: PERSON SIZE  REPLANTED PROCEDURES PROCEDURES  Spindle, rpm 80 Feed: Feed: PERSON Cutting Fluid: UPY Depth: (Ind. Reading) 2,5 11										
Surface Finish, AA /C Bluing Pin Rollout Protrusion, in. //8 Perpendicularity, .001 in./in. Longitudinal .001 Transverse.001 Flush Gage Reading, in. Capacitance Gage Reading 267 Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position										
13 75	Axial Position	0°	45°	90°	180°	225°	270°	315°		
J	Bottom #1 #2 #3 #4 #5	-9.0 5.0 7.0 9.0	15 4.0 11.0 13.0 11.0	13.0 12.0	-9.5 5.5 6.5 4.0 4.5	-//: 3 3 0 1 4 7	-95 4.0 6.0	/ 5.0  /		
Proti Perpo I Flusi Capad	Surface Finish, AA -5  Protrusion, in. //2 Perpendicularity, .001 in./in.  Longitudinal .0015 Transverse 1004 Flush Gage Reading, in001 Capacitance Gage Reading 247 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
54/	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	8ottom #1 #2 #3 #4 #5	-77 6.0 2.0 7.0	-6) ") ;;;;	8.0 4.0 6.0 9.0	-8.0 5.0 7.0 8.0 7.0	-ジュ ブ:ご バ:フ /: フ	-30 11.0 14.0 15.0 1.0	-9.0 4.0 6.0 7.3		

	МА	NUFACTU	RING REP	ORT: T	APERED H	IOLES				
Test Se Specime	eries $\frac{19}{283}$	Qual	ity Vari	able St	IRIPE 1 N. J.	· Reu 12.	TRIES	ץ דין מים		
<u>ر در ] در</u> ۱ <u>۱۲۰</u> Spin	Hole Manufacturing Conditions and Procedures: REFT UNIER SIZE  PLANT 1/15 REFT NOOD L.H. SPINAL REARING USE  Still 1 1/15 Pin = R Plune 1/10 ± 100 p. 11/10 VERSE P.S.  Spindle, rpm 80 Feed: SETTER  Cutting Fluid: DAY Depth: (Ind. Reading) 2.500									
Prot Perp L Flus Capa	Surface Finish, AA / Co - 10 S Bluing Pin Rollout Protrusion, in. /22 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .005 Trush Gage Reading, in. Capacitance Gage Reading 239 Exit Burr Height, in.  Air Gage Readings (.0001 in.) Angular Position									
3	Axial Position	0°	Angu 45°	90°	180°	225°	270°	315°		
	#2 #3 #4 #5	- 9.C 9.0 5.0 8.0	-3.0 3.0 9.0 11.0	-2.0 4.0 9.0 12.0	-40 5.6 2.0 6.5 5.0	- ( ) 6.0 8.0 9.0 9.0	-90 20 80 11.0 11.0	-9.0 9.0		
Proti Perpe l Flush Capac	Surface Finish, AA //5 / 2 5  Protrusion, in. //0  Perpendicularity, .001 in./in.  Longitudinal O Transverse . 263  Flush Gage Reading, in. Capacitance Gage Reading 3/0  Exit Burr Height, in.									
319		<u>A</u>		Reading ar Posi		l in.)				
32.1	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4	-13 J 7 J 3 J 3 J	-110 4.0 4.0 3.0	-12 J 3 C 3 S 7 C	-/3 4.0 4.0	1: 3 5 0 4 0 2 0	-/2.J 5.C 5. J	-150 30 3.0 1.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>19</u> en No. <u>4821</u>	Qual	ity Vari	able Su	PAFECC D. I.	R2131	1111	אַליינועם		
Hole Manufacturing Conditions and Procedures: What I SEE  REAL IN 1.755 REPORTS LIFE SPICE REAL OF USE  STREET Flutt REN A Plug 1.705 two in transcent possible, rpm 80 Feed: FEED 17  Cutting Fluid: DRY Depth: (Ind. Reading) 2500										
Surface Finish, AA /C Hole #1  Protrusion, in. //8  Perpendicularity, .001 in./in.  Longitudinal O Transverse .col  Flush Gage Reading, incol  Capacitance Gage Reading 309  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
3:	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-10.0	-10.	-11:2	-12.0	15.10	15.	125		
	#2	5.0	5.0	7.0	40	3.0	45	4.0		
	#4	4.0	16.0	11.5	3.0	20	7.0	6		
	#5	7.0	1/ 2	1.7.2	14.0	0.5	1/2.0	170.0		
Protr Perpe L Flush Capac	Surface Finish, AA  Protrusion, in. // 9  Perpendicularity, .001 in./in.  Longitudinal .01 / Transverse .00/ Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
306	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1		100	-11.0	-9.0	-11.0	-90	:100		
	#2	30	4.7	2.0	4.0	3.0	8.0	4.0		
1	#4	30		12.0	6.0	11.0	11.0	Sili		
L	#5	45	120	11.0	7.0	10.0	11.0	7.0		

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	ries <u>19</u> n No. <u>1846</u>	Quali	ity Vari	able Si	IN FACE MARK	F. BOUY	HOVESS - 1	CALLY			
Hole Manufacturing Conditions and Procedures: PERN UNATIONE    PERNER   1.755   REFERENCE LAND   L.M. S.D. MAI   PERNER   1151    STRIGHT FIVE   PERNER DIVING 1700   200   M TRANSVERSE   200.  Spindle, rpm   80   Feed:   8 5.D. M.  Cutting Fluid:   D.P.Y.   Depth: (Ind. Reading)   200.											
Surface Finish, AA //3 Protrusion, in. 1/5 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .001 Flush Gage Reading, in001 Capacitance Gage Reading 248 Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
525	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	-8.0 7.0 12.0 14.0	-7.0 10.0 13.0 14.0	7.0 10.2 13.2 14.0 14.0	-70 7.0 9.0 11.0 13.0	8.0 12.0 12.0	10.0 13.3 15.3 13.3	14.0 13.0			
Protr	ace Finish, A	7	<del>2</del> 7	lole #2		Blui	ng Pin I	Rollout			
Flush Capac	endicularity, congitudinal n Gage Readin citance Gage Burr Height,	rool ng, in. Reading		rse , <u>00</u>	<u>3</u> _ 70 _	5%		(b)			
312		<u>A</u>		Reading ar Posi		<u>  in.)</u>					
/? <b>\$</b> }	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	· R. O	-8.0	13.0	-8,5	-4.0	-4.0	7.0			
	#2	90	13.0	140	7.0	14.0	14.5	13.0			
	#4	15.0	14.0	15.3	12.0	15.0	1 3	15.0			

	M	ANUFACTU	RING REP	ORT: T	APERED H	HOLES				
Test Se Specime	eries <u>/9</u> en No. <u>16/</u> 7	Qual	ity Vari	able 50	ARM I	1:1:0	1.17125.	VHICY		
Hole Manufacturing Conditions and Procedures: REFIGURE 18 18 18 18 18 18 18 18 18 18 18 18 18										
Surface Finish, AA 96.75  Protrusion, in. 2/9  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse .2015  Flush Gage Reading, in. 0  Capacitance Gage Reading 245  Exit Burr Height, in.										
318		<u>A</u>		Reading lar Posi	s (.000	<u>1 in.)</u>		′ -		
3,3	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4	- '.J 8 2 13 2 13 0	-7.0 11.0 14.0 15.0 12.0	14.0 15.0 12.0	6.0 5.0 7: 13	-5.0 10.0 14.0 13.0	-4.0 12.0 14.0 15.0 12.0	-7.5 13.2 14.2 14.2		
Perpo I Flusi Capad	Surface Finish, AA 92.  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal Transverse 33  Flush Gage Reading, in,002  Capacitance Gage Reading 239  Exit Burr Height, in.									
312		<u>A</u>		Reading ar Posi	s (.0001 tion	in.)				
121	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4 #5	-7.0 80 11.0 140	- 7. 0 13. 0 14. 0 14. 0	7.0 10.3 14.0 15.0 14.0	-> ) 7.0 12.0 13.0 12.0	-6.0 11.0 14.0 14.0	-42 13.3 15.2 14.0	-2.5 9.0 1:5 1:5 1:5		

MANUFACTURING REPORT: TAPERED HOLES										
Specimen No. 2/5/3 Quality Variable Superior 1951/100 1951/100										
Hole Manufacturing Conditions and Procedures: REPLANDER SIZE  RIP A 1.75 REPLANDED LAND SIZE REPLANDER SIZE  STRIFF FIMIL 18 PROPERTY FOR EACH OF TRANSPORT FOR Spindle, rpm 80 Feed: SE SIRE  Cutting Fluid: DBY Depth: (Ind. Reading) 2.380										
Surface Finish, AA 95 Hole #1  Protrusion, in. 220  Perpendicularity, .001 in./in.  Longitudinal 1005 Transverse .002  Flush Gage Reading, in.  Capacitance Gage Reading 232  Exit Burr Height, in.										
192				Readin	gs (.000	01 in.)				
3/7	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 -6.0 -6.0 -5.0 -9.0 -4.0 -3.0 -5.0 -5.0 -9.0 -9.0 -9.0 -9.0 -9.0 -9.0 -9.0 -9									
Proti Perpe l Flush	Surface Finish, AA 105 Bluing Pin Rollout Protrusion, in. 216 Perpendicularity, .001 in./in. Longitudinal O Transverse .003 Flush Gage Reading, in. O Capacitance Gage Reading 251									
312		A		Reading lar Posi	s (.000 tion	1 in.)				
13.25	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3 #4	-7.0 7.0 8.0 11.0	10.0 10.0 14.0	-7.0 11.0 14.0 15.0	-6.0 7.0 10.0 12.0	-8.0 11.0 14.0 14.0	-4.0 //.2 /4.2 /5.2	·5. 0 9. 0 14.0		

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 19 Quality Variable SUBFECE ROUTH NEWS CHALLY Specimen No. 3057  ACCUSE THE LANGE CHALLY											
Hole Manufacturing Conditions and Procedures: 1910 1911 1915 1915 1915 1915 1915 1915											
Surface Finish, AA 95  Protrusion, in. 25  Perpendicularity, .001 in./in.  Longitudinal .00/5 Transverse .002  Flush Gage Reading, in. 0  Capacitance Gage Reading 258  Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
312	Axial Position	0°	45°	90°	180°	225°	270°	315°			
スニン	Bottom #1 -8.0 -9.0 1/0 -5.7 5 -2.0 -5.										
	#3	11.3	14.0	14.5	10.0	12.0	15.0	14.0			
	#4	13.)	13.2	15.0	13 3	13.0	14.0	15,0			
Protr Perpe L Flush Capac	Surface Finish, AA /05  Protrusion, in. 228  Perpendicularity, .001 in./in.  Longitudinal O Transverse O  Flush Gage Reading, in. Capacitance Gage Reading 247  Exit Burr Height, in.										
310		<u>A</u>	ir Gage Angul	Reading ar Posi	s (.000 <sup>°</sup> tion	1 in.)	· · · · · · · · · · · · · · · · · · ·				
77 -	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	#2 #3 #4 #5	9.0	6.0 8.0 13.0 13.0	-9.0 10.0 13.0 15.0 14.0	-8.0 7.0 3.3 5.3 6.2	-9.0 10.0 13.2 13.2 14.3	-80 10.0 13.0 12.0	-8.0 5.0 9.0 12.0			

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 19 Quality Variable Suprace Rolling News OVAILTY Specimen No. 4818 A1AV, INT. 12518195											
Hole Manufacturing Conditions and Procedures: RERM UNDFILL ZE  REPARED 1255. READ NO. 1. H. S.D. DOL 12 SENS USE  STRIBAT FIUTE READ TR. 1911/45 1.200 ± 006 IN THEM VERSE 1203,  Spindle, rpm 80 Feed: 55 8 E.M.											
Cutting Fluid: 11/1: Depth: (Ind. Reading) 380											
Hole #1 Surface Finish AA /2/2 Rhuine Rie Rollout											
Prot	Surface Finish, AA $\frac{120}{220}$ Bluing Pin Rollout										
Perp	endicularity ongitudinal	, .001 i		se 40.5	)						
Flus	h Gage Readi	ng, in.	_0	-001		55h	1				
	citance Gage Burr Height		1 142			J- 1	·				
	7.	Δ	ir Gage	Reading	 is (.000	1 in.)	سنر ا	200			
218	Air Gage Readings (.0001 in.)  Angular Position										
324	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 -10.0 -9.0 -9.0 -8.0 -5.0 -4.0 -7.0										
	#2	5.0	13.0	11.0	7.0	13.0	12.0	11.0			
	#4	120	13.0	13.0	13.0	13.0	15.0	15.0			
		74.0	·		1/3 10	1/2/0		1. F. V			
	ace Finish, A			Hole #2		Blui	ng Pin F	Rollout			
Proti	rusion, in endicularity,	2/4	/								
ι	Longitudinal	1001		rse , <b>98</b>	1/5	M					
	h Gage Readin citance Gage		26:	-	_ 6	,5° <b>4</b>	1/244-4				
	Burr Height,	_									
312		<u>A</u>		Reading ar Posi		1 in.)		AN & 100°			
324	Axial										
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-9.0	-8.0	-90	-7.0	-11.0	رج -	-90			
	#2	6.0	9.0	12.0	5.0	120		5.0			
	#4	10.0	15.3	14.0	13.0	13.0	140	13.3			
	#5	17.0	7.0	17.0	13.7	12.0	14.0	171			

INSPECTION SHEETS FOR TEST SERIES 20/21 COMBINED VARIABLES, REVERSE DOGBONE SPECIMENS
R RATIO = 0.1

MANUFACTURING REPORT: TAPERED HOLES											
	Test Series 21 Quality Variable Surgace Roughness 145Ans Specimen No. 4018C 4 6C3BC										
Hole Ma	Hole Manufacturing Conditions and Procedures: 12-din Loith Under-										
Spindle, rpm 80 Feed: S 8 I.P. 74. Cutting Fluid: DIPY Depth: (Ind. Reading) 2 450											
Surface Finish, AA 95-100 Bluing Pin Rollout											
Perp L Flus	Protrusion, in. /55 Perpendicularity, .001 in./in. Longitudinal O Transverse .0005 Flush Gage Reading, in. 1062										
	citance Gage Burr Height		322	770		•					
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2	-5.0	-3.0	4.0	-8.0	-11.0	-9.0 3.0	-10.0 3.0			
	#3	3.0	3.0	3.0	3.0	20	4.0	40			
	#5	3.0	1.0	2.0	4.0	4.0	5.0	5.0			
	ace Finish, A	A 25		dole #2		Blui	ng Pin F	Rollout			
Perp	rusion, in. endicularity,						•5				
Flus	Longitudinal h Gage Readin	g, in.	0.	se o	— 89	do	2				
	citance Gage Burr Height,		327				1770				
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 -5.0 -3.0 -3.0 -9.0 -9.0 -8.0 -8.0 #2 4.0 6.0 5.0 3.0 3.0 4.0 3.0										
	#3	4.0	4.0	4.0	3.0	2.0	3.0	20			
	#5	3.0	1.0	2.0	40	3.0	3.0	3.0			

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable Specimen No. 2B2BCL3C2BC											
Hole Manufacturing Conditions and Procedures: Region With Under- SIZE Reduced 1.255, Resem 1000 b. H. St. Co.  Spindle, rpm 80 Feed: FEED.											
Spindle, rpm 80 Feed: Fe											
Surface Finish, AA //0-/30 Bluing Pin Rollout Protrusion, in. /// Perpendicularity, .001 in./in.											
Longitudinal Flush Gage Readi Capacitance Gage	Perpendicularity, .001 in./in.  Longitudinal .0005 Transverse .002  Flush Gage Reading, in. Capacitance Gage Reading 275  Exit Burr Height, in.										
Air Gage Readings (.0001 in.)											
Axial Position											
Bottom #1 #2	6.0	2.0	5.0	-7.0	-60	-800	7.0				
#3 #4 #5	5.0 3.0	5.0	5.0 3.0 5.0	5.0 3.0 6.0	1.0	3.0	5.0				
Surface Finish,		0-110	dole #2		Blui	ng Pin I	Rollout				
Protrusion, in. Perpendicularity Longitudinal Flush Gage Readi Capacitance Gage	, .001 i <u>//00 /</u> ng, in. Reading	n./in. Transvei	se , <u>000</u>	- - - -	de						
Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position											
Axial Position											
Bottom #1 #2											
#3 #4 #5	40	3.0	4.0 2.0 4.0	5.0 1.0 4.0	3.0 20 3.0	2.0 2.0 4.0	2.0				

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable SURFICE ROUGHNESS 125 RIMS Specimen No. 6C37 L3CGTC											
Hole Manufacturing Conditions and Procedures: Regim Understate Learn With 1900. L.H. Spinal Regimen											
Spindle, rpm 80 Seed: 58. IP.M. Cutting Fluid: 088 Depth: (Ind. Reading) 2850											
Hole #1 Surface Finish, AA 96-16-0 Bluing Pin Rollout											
Protrusion, in. Perpendicularity		n./in.		<del></del>							
Perpendicularity Longitudinal Flush Gage Readi	ng, in.	ransver	se .00	<del>2</del> 96	of		•				
Capacitance Gage Exit Burr Height	Reading	308	<del>,</del>	_ ( ·			1				
The same morgine	-	ir Gage	Reading	 ( 000	1 in )						
	Air Gage Readings (.0001 in.) Angular Position										
Position	Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1	-2.0	-3.0	-5.0	-7.0 2.0	-10.0	-15.0	3.0				
#2	2.0	3.0	3.0	4.0	3.0	3.0	3.0				
#4	1.0	1.0	2.0	6.0	3.0	5,0	3.0				
			tole #2								
Surface Finish, a Protrusion, in.		_			Blui	ng Pin I	Rollout				
Perpendicularity	, .001 i		- 0		,	-	*				
Longitudinal Flush Gage Readi		Transver		= 35		-	med.				
Capacitance Gage Exit Burr Height		330				<b>₹</b> 5	**				
External horight	_	In Con-	Dood in a	<del></del>	۱. ۲ سال						
	Air Gage Readings (.0001 in.) 'Angular Position										
Axial Position											
Bottom #1	-8.0	-7.0	6.0	-9.0	-12.0	-10.0	-10.0				
#2	3.0	2.0	4.0 2.6	30	4.0	2.0	3.0				
#4	2.0	1.0	1.0	2.0	3.0	4.0	2.0				

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	Test Series 2/ Quality Variable SURFOCE ROUYANISS 125/RES Specimen No. 363/36 L 683/36										
Hole Manufacturing Conditions and Procedures: Beam with United.  Size Research 1.755 18530 1100. L.H. 50, and Personal											
Spindle, rpm 80 Feed: 5 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7											
Hole #1 Surface Finish, AA 90-110 Bluing Pin Rollout											
Perpo Lo Flus Capa	Protrusion, in. //3 Perpendicularity, .001 in./in. Longitudinal 100/5 Transverse .001 Flush Gage Reading, in. Capacitance Gage Reading 320 Exit Burr Height, in.										
		<u>A</u>			s (.000	<u>in.)</u>		Care			
	Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	-8.0	-5.0	-6.0	7.0	-12.0	-13.0	10.0			
1	#2	3.0	3.0	2.0	4.0	3.0	2.0	2.0			
	#4	2.0	2.0	2.0	3.0	3.0	3. 6	d. 0			
	#5	4.0	2.0	5.0	1500	5.0	5.0	4.0			
Protr Perpe L Flush Capac	Surface Finish, AA 95-105 Protrusion, in. 170 Perpendicularity, .001 in./in. Longitudinal 0 Transverse 0 quality Capacitance Gage Reading 316 Exit Burr Height, in.										
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1										

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Series Specimen No.	Test Series 11 Quality Variable SURFICE ROLYANESS 125 HIPS Specimen No. 3C3BC L 4L3TC										
Hole Manufacturing Conditions and Procedures: Redw. With UNITED SIZE REDWORK 1.255. Redwar MOD L. H. Spiral Medical											
Spindle, rpm 80 Feed: SS & J.P. 17. Cutting Fluid: DRY Depth: (Ind. Reading) 2450											
Surface Finish, AA 90-100 Bluing Pin Rollout Protrusion, in. Perpendicularity, .001 in./in. Longitudinal .0005 Transverse .001 Flush Gage Reading, in. Capacitance Gage Reading 328 Exit Burr Height, in.											
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bot	tom #1 -	4.0	-8.0 3.0	-8.0 3.0	-8.0 3.0	-9.0 3.0	-11.0	-8.0 3.0			
	#3 #4 #5	40	2.0	2.0 4.0	3.0	510	3.0	3.0			
<u> </u>		3 · U		01e #2	2.0	4.0	4.0	410			
Protrusion Perpendicu Longio Flush Gage Capacitano	Surface Finish, AA 100-105  Protrusion, in. 187  Perpendicularity, .001 in./in.  Longitudinal 10015 Transverse 1001  Flush Gage Reading, in. 1002  Capacitance Gage Reading 300  Exit Burr Height, in.										
Air Gage Readings (.0001 in.)											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bott	Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 - 9.0 - 6.0 - 4.0 - 7.0 - 10.0 - 10.0  #2 2.0 5.0 4.0 3.0 2.0 2.0 2.0  #3 4.0 4.0 4.0 3.0 4.0 4.0 4.0  #4 2.0 2.0 2.0 4.0 4.0 3.0 4.0 3.0 4.0  #5 3.0 2.0 2.0 4.0 4.0 3.0 4.0										

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	Test Series 2/ Quality Variable SURFACE - 1100 - 4 n 555 Specimen No. 6638 2 213 576 MIO. TIM. 125 RIMS										
Hole Manufacturing Conditions and Procedures: REFINE UNDER SIZE  REFINER 1.75 . REMINA NAOD 617. SP. RILL PREFINER											
Spindle, rpm Feed: St. P. 17. Cutting Fluid: DRY Depth: (Ind. Reading) 2.440											
Surface Finish, AA 105 Hole #1  Protrusion in 174											
Perp L Flus Capa	Protrusion, in. 771 Perpendicularity, .001 in./in. Longitudinal 10015 Transverse 0 Flush Gage Reading, in,00/ Capacitance Gage Reading 310 Exit Burr Height, in.										
	Air Gage Readings (.0001 in.)										
	Angular Position + Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Position		45°	90°	180°	225°	270°	315°			
	Bottom #1 #2	3.0	3.0	3.0	2.0	1.0	-15:0	2.0			
	#3	5.0	4.0	4.0	3.0	3.0	3.0	4.0			
	#4	50	40	4.0	3.0	3.0	3.0	4.0			
	<u></u>							7:0			
Protr	ace Finish, A	172	90	dole #2	_	Blui	ng Pin f	Rollout			
	endicularity, ongitudinal		n./:n. Transver	Se (00)	من م						
Flush	Gage Readin	g, in.	0		<u>~</u>	06					
	itance Gage Burr Height,		298	?	_ /						
EXIL	burr neight,			<del></del>				ill			
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 -13.0 -15.0 -14.014.0 -14.0 -14.0										
	#2	3.0	2.0	3.0	1.0	3.0	3.0	3.0			
ŀ	#3	4.0	3.0	4.0	3.0	40	4.0	4.0			
	#5	4.0	40	4.0	3.6	3.0	40	4.0			

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable SURFACE - PRIVATION Specimen No. 3045 L31572 MICH SPICE 18 (RICE)											
Hole Manufacturing Conditions and Procedures: REAM! UNDER- 5, 2E											
Spindle, rpm 80 Feed: 177.75 Cutting Fluid: 177.75 Depth: (Ind. Reading) 2.441											
Hole #1 Surface Finish, AA //0 //> Bluing Pin Rollout											
Prot	rusion, in.	772				Blui	ing Pin	KOTTOUT			
Perp	endicularity ongitudinal	, .001 i	n./in. ransver	sevacil	<del></del>	1	1.	•			
					<u> </u>	5%	•	ì			
Capa Exit	n Gage Readii citance Gage Burr Height	Reading , in.	325	<u> </u>				V			
			I. C	Dandia.	- / 000	• •= V					
		<u> </u>		Reading lar Posi		: in.)					
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	-14.0	-14.0 3.0	11/0	-15.0	-14.0	-140	-15.0			
	#2	2.0		30	3.0	2.5	2.0	2.0			
	#3	4.0	4.0	3.0	3.0	3.0	3.0	40			
	#5	4.0	1.3	3.0	3.0	3.0	2.0	3.0			
Surfa	ace Finish, A	A 113	2-11-5	101e #2		Blui	ng Pin f	Rollout			
Perpe	endicularity,	.001 i	n./in.			,		3-			
	ongitudinal		Transver	se O	- 4	04	.1	` <del>*</del>			
	n Gage Readin :itance Gage		170		''						
	Burr Height,										
				D		·- \					
		<u>A</u>	Angul	Reading: ar Posi	tion	<u> </u>		A <sup>1</sup>			
	Axial						_				
	Position	0°	45°	90°	180°	225°	270°	315°			
		-14.2	-13.0	-12.0	-14,5		-15.0	15.0			
	#2	3.2	3.0	4.0	3.0	2.0	2.0	3. 6.			
}	#3	5.0	5.0	5.0	4.0	3.0	3.0	40			
Ì	#5	4.0	5.0	5.0	40	3.5	3.0	5.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries <u>1/</u> n No. <u>603†C</u>	Qual (	ity Vari	able 5	CE IN	RS 13	shees.			
14.2.34	nufacturing <u>・ ピペ 1/55</u> dle, rpm g	I SEA	ons and	i hitt.	SAGA	1 1 1	112 11	, 		
Cutt	ing Fluid:	DRY		De	pth: (I	nd. Read	ر کر کر ا غ (ding	440		
D	Surface Finish, AA /65  Protrusion, in. /63  Perpendicularity, .001 in./in.  Longitudinal O Transverse 10015									
Capa	Longitudinal O Transverse 10015  Flush Gage Reading, in. O 15  Capacitance Gage Reading 310  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	-13.0 3.0	-14.0 3.0	75.0	-14.5	-15.0 2.J	-140	14.1		
	#3 #4 #5	5.0 5.0 4.0	5.0 5.0 40	5.0	5.0 4.0	4.0 3.0 4.0	4.0	5.0 4.0		
-		7.0		iole #2	7.0	7.0		9,9		
Protr Perpe	ace Finish, A rusion, in. endicularity,	768 .001 i	<i>℃ 4</i> n./in.			Blui	ng Pin f	Rollout		
Flush Capac	ongitudinal n Gage Readin citance Gage Burr Height,	g, in. Reading	002		= 7 <sup>5</sup>	lo :	: 			
	but herght,		ir Gage Angul	Reading ar Posi		in.)	•			
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 -15.0									
	#3 #4 #5	4.0 4.0 3.0	4.0 3.0	4.0	3.0	4.0	40 40 40	3.0 3.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>d/</u> en No. <u>2/32†/</u>	Qual 1 <u>13661</u> 3	ity Vari €	iable 5	UPFFCE GO. I.	- 1950 - 123	PARE	55		
Hole Manufacturing Conditions and Procedures: REFOR UNDER SIZE  131 FOR A 1.755 A PERMEN A DD. LIH. SI LES PERMER										
Spindle, rpm 80 Feed: 10 Feed:										
Surface Finish, AA //5 Bluing Pin Rollout Protrusion, in. //0 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .0015										
Capa	Longitudinal .001 Transverse 10015 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-9.0	-10.0	-9.0	-10.0	-10.0	-15.0	-9.0		
	#2	5.0	3.0	3.0	4.0	3.0	70	5.0		
	#4	5.0	4.0	4.0	50	3.0	4.0	4.0		
	#5	5.0	6.0	6.0	6.0	5.0	5.0	6.3		
Protr Perpe L Flush Capac	Surface Finish, AA 99-100 Protrusion, in. 175 Perpendicularity, .001 in./in. Longitudinal 1001 Transverse 0 Flush Gage Reading, in. Capacitance Gage Reading 191 Exit Burr Height, in.									
ſ	Axial	-	ir Gage Angul	ar Posi				·		
	Position	0°	45°	90°	180°	225°	270°	315°		
		10.0	-12.0	-11.0	-10.0	-11.0	-9.0	-4.0		
ļ	#2	3.0	3.0	3.0	50	3.0	4,0	4.0		
ŀ	#3	5.0	5.0	50	3.0	4.0	5.0	5.0		
ł	#5	5.0	6.0	6.0	5.0	5.0	6.0	7.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>1/</u> en No. <u>3<i>E21</i>3</u>	Qual <i>I 6 B 4 t</i>				BCI Int. 1				
Hole Ma	inufacturing   <u> w ~ W 1.955</u>	Condition. REA	ons and	Procedu M. L. L	res: [	AFIN B	UNDES EARTE	.512E		
		80 DRY		F D	eed: 5 epth: (1	nd. Rea	ارم. ding) ع	440		
	ace Finish,			Hole #1		Blu	ing Pin	Rollout		
Perp	Protrusion, in. 178									
	ongitudinal h Gage Readi			se <u>0</u>	_ 90	oli	, ,	* <b>(</b>		
Capa	citance Gage Burr Height	Reading		2	_			- A		
Air Gage Readings (.0001 in.)										
Angular Position +										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-12.0	-15.0	-15.0	-14.0	-14.0	-	-15.		
	#2	2.0	4.0	3.0	3.0	4.0	3.0	3.0		
	#4	2.0	3.0	4.0	40	3.0	3.0	3.0		
	#5	4.0	40	4.0	5.0	3.0	3.0	3.0		
· · · · · · · · · · · · · · · · · · ·				Hole #2			<del></del>			
	ace Finish, Frusion, in.	AA //		1016 #2		Blui	ng Pin f	Rollgut		
Perpe	endicularity,	.001 i	n./in.	<del></del>		1				
	ongitudinal			rse o	1 151	1		. `		
	n Gage Readir citance Gage		301		_ ′			,		
	Burr Height,		201				-1-	. ]		
		Δ	ir Gage	Reading	s (.0001	lin.)		.		
				ar Posi						
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	14.0	13.2	-15.0	-15.0	-15.2	-14.0	-14.0		
	#2	3.0	4.0	20	1.0	30	3.0	3.0		
	#3	5.0	5.0	5.0	5.0	4.0	4.0	4.0		
	#4	40	4 3	40	40	3-0	3/0	40		

	MANUFACTURING REPORT: TAPERED HOLES										
Test Series 11 Quality Variable Santal-13 augh west Science Specimen No. 2ACTC - 4FGBC NO. U- INT. 125/PMS											
Hole Manufacturing Conditions and Procedures: Report with Underly  SIZE REALITY 1.755 REALITY AT U Little SP. (12) REALITY  USE BOILTY TOOL SET ACS KINGLEST FOR SELECTION  Spindle, rpm 80 Feed: 55 8 I PAIL											
Cutting Fluid: DILY Depth: (Ind. Reading) 2.450											
Hole #1 Surface Finish, AA 95 Bluing Pin Rollout											
Surface Finish, AA  Protrusion, in. 170  Perpendicularity, .001 in./in.  Longitudinal 101 Transverse 0  Flush Gage Reading, in. 101  Capacitance Gage Reading 135											
Exit	Burr Height	, in									
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2	-8.0	-10.0	15.0	-7.0	6.0	-11.0	-9.0			
	#3	7.0	4.0	40	2.0	6.0	5.0	20			
	#4 #5	8.0	7.0	100	10.0	10,0	6.0	7.0			
Surface Finish, AA 100-110 Bluing Pin Rollout Protrusion, in. 186 Perpendicularity, .001 in./in. Longitudinal 101 Transverse 0 Flush Gage Reading, in. 1001 Capacitance Gage Reading 238 Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-7.0	-6.0	-8.0	-6.0	-5.0		-11.0			
	#2 #3	20	4.0	3.0 4.0	6.0	20	6.0	6.0			
_	#4	72	12.0	5.0	120	12.0	10.0	8.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 21 Quality Variable SURFACE - ROUSENESS - SCRAFCE Specimen No. 6828 - 6067 A7. 0- INT. 125 R.MS										
Hole Manufacturing Conditions and Procedures: Rear, with UNDELL-  SIZE REAMEN 1.755, REAM MOD, L.H. SA, RAI REAMEN  USC BARLOS TEAL SET LOCK & PULL OUT FOR SCRETCH  Spindle, rpm 80 Feed: S & I. P. M.  Cutting Fluid: ORY Depth: (Ind. Reading) 2450										
Surface Finish, AA 95-105  Bluing Pin Rollout Protrusion, in. 74										
Perpendicularity, .001 in./in.  Longitudinal O Transverse .0005  Flush Gage Reading, in001  Capacitance Gage Reading 231  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90°	180°	225°	270°	315°						
Bottom #1 7.0 -10.0 -11.0 #2 5 0 5.0 4.0 #3 7.0 7.0 6.0	7.0	-90 2.0	6.0	5.0						
#4 8.0 7.0 5.0 #5 11.0 11.0 9.0	y.0 7.0	7.0	5.0	9.0						
Surface Finish, AA 110-120		Blui	ng Pin F	Rollout						
Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal. 60/5 Transverse .00  Flush Gage Reading, in.  Capacitance Gage Reading  Exit Burr Height, in.	_ 	glo		等 ^						
Air Gage Reading Angular Posi		in.)	, i							
Axial Position 0° 45° 90°	180°	225°	270°	315°						
Bottom #1 -6.0 -8.0 -9.0 #2 6.0 4.0 3.0 #3 7.0 6.0 4.0	12 6.0 4.0 3.0 5.0 5.0 5.0									
H4 70 20 40 H5 12.0 12.0 12.0	8.5	2.3	6.0	50						

MANUFACTURING REPORT: TAPERED HOLES									
Test Series 2/ Quality Variable SUMFACE-ROUGH - SERVING Specimen No. CCSTC-2017C MIO-IM. 125 NMS									
Hole Manufacturing Conditions and Procedures: REAS WITH UITOERS  SIZE REFRENCIA 1755 NEAR 1960 L.H. SOLIS OF REPORT  USE BILL TOOL SET 185 LAUL OUT FAIL SCHOOL TO  Spindle, rpm FO Feed: SET 19 Man.  Cutting Fluid: DRY Depth: (Ind. Reading) 2,450									
Surface Finish, AA   00-105 Bluing Pin Rollout Protrusion, in.   PR Perpendicularity, .001 in./in. Longitudinal .0015 Transverse O Flush Gage Reading, in001 Capacitance Gage Reading 224 Exit Burr Height, in.									
Air Gage Readings (.0001 in.)									
Angular Position   Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 -6.0 -8.0 -11.0 -9.6 -5.0 -8.c -7.0  #2 5.0 5.0 4.0 5.0 7.0 5.0 5.0  #3 6.0 7.0 6.0 7.0 8.0 7.0 7.0  #4 7.0 8.0 7.0 8.0 8.0 7.0 9.0  #5 120 120 120 13.0 12.0 7.0 7.0									
Surface Finish, AA 95 Bluing Pin Rollout Protrusion, in. 179 Perpendicularity, .001 in./in. Longitudinal 2015 Transverse .0015 Flush Gage Reading, in002 Capacitance Gage Reading 227 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 -5.0 -8.0 -8.0 -8.0 -5.0 -8.0 -5.0 #2 7.0 6.0 5.0 5.0 6.0 7.0 6.0 #3 10.0 8.0 7.0 5.0 8.0 7.0 7.0 #4 11.0 9.0 7.0 12.0 8.0 7.0 1.0 #5 12.0 12.0 12.0 13.0 11.0 14.0 10.0									

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries 21 n No. 2068	Qual (-685	ity Vari	lable S	MERCE	- 19000+A	125111	SCANKA 13		
Hole Manufacturing Conditions and Procedures: REALL ACID UNDER SIZE IN THE SIZE IN THE SIZE IN THE SIZE IN THE SIZE IN THE SIZE IN THE SPINAL OF FOR SCRIPTCH Spindle, rpm 80 Feed: ST 8 IN NO.										
Cutting Fluid: DILY Depth: (Ind. Reading) 2.450										
Hole #1 Surface Finish, AA //O Bluing Pin Rollout										
Proti	rusion, in.	174		· · · · · · · · · · · · · · · · · · ·		DIU	ing rin	KOTTOUT		
	endicularity ongitudinal			se .001		.1		**		
Flush	n Gage Readi	ng, in.	.00		_ 6	slo	,	, p (39)		
	itance Gage Burr Height		145					.*a N <sub>a</sub> .		
	Air Gage Readings (.0001 in.)									
Angular Position •										
	Axial Position	00	45°	90°	180°	225°	270°	315°		
	Bottom #1	-90	-90	-9.0	-1.)	-8.0	-110	-11.0		
	#2	5.0	30	4.0	3.0	5.0	30	5.0		
	#4	8.0	2.0	3.0	3 2	2.0	6.0	7.0		
[	#5	10.0	8.0	7.0	7.0	¥.,	6.0	20		
	ce Finish, A	ΛΑ <u></u>	125-1	dole #2		Blui	ng Pin I	Rollout		
	usion, in. ndicularity,	180			<del></del>			•		
	ongitudinal			se de	22 1	1		S		
	Gage Readin		0	<u> </u>	<u> </u>	ひ		`		
	itance Gage Burr Height,		ه د ت		<del></del>			j		
		A		Reading ar Posi	s (.0001 tion	in.)		manuja N		
٢	Axial									
	Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-70	-90	-/3.)	-70	-5.0	-6.0	-710		
	#2	4.0	3,0	ن . ئ	4.0	5.0	5.0	40		
-	#3	8.0	6.0	3.0	5.0	70	20	40		
-	#5	10.0	1.7	9.0	12.0	90	90	6.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 21 Quality Variable SURFACE VICUSTORIS SCHAFEN Specimen No. 2 <u>M3CC</u> - 6C/B ATTURN 125 MINS										
Hole Manufacturing Conditions and Procedures: Per Pin Whater Size / Conditions and Procedures and Per Pin Whater Size / Conditions and Procedures and Pro										
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal 1061 Transverse 10015  Flush Gage Reading, in.  Capacitance Gage Reading 220  Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
Air Gage Readings (.000! in.)  Angular Position										
Axial Position	00	45°	90°	180°	225°	270°	315°			
Bottom #1 #2 #3 #4	-40 6.0 8.0 9.0	-40 60 8.0 90	70 4.0 6.0 8.0 13.0	-70 2.0 3.6 4.0	2.0 6.0 2.0 2.0	-4/-c 5.0 5.0 12.0	-6 c 40 5.0 5.0			
Surface Finish, AA   O   Bluing Pin Rollout Protrusion, in.   Perpendicularity, .001 in./in.   Longitudinal   Transverse .0005   Transverse .0005   Exit Burr Height, in.										
	<u> </u>	ir Gage Angu	Reading lar Pos		<u>1 in.)</u>	•	•			
Axial Position	00	45°	90°	180°	225°	270°	315°			
Bottom #1	-11.0	- 7.0	8.0	-3.0	40	.5.0	-7.0			
#2	4.0	2.0	6.0	33	2.0 5.0	7.0	10			
#4	60	6.0	5.0	6,0	9.0	90	20			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 21 Quality Variable SURFACE - ROUGA MESS - SCRAFCH Specimen No. 304rc 4 403rc MIO. INT. 12 TRMS										
Hole Manufacturing Conditions and Procedures: REHN: UPBER SIE REMOVED 1985 REAM ACOULTH SOUTH REMOME USE BAR OF TWO SET, USS & NAU OMT FOR SICKETON										
Spindle, rpm 70 Feed: FEEd: 18 F. 19. Cutting Fluid: 10. 14. Depth: (Ind. Reading) 2.440										
Surface Finish, AA /00 Bluing Pin Rollout										
Protrusion, in. 184 Perpendicularity, .001 in./in. Longitudinal .0005 Transverse .0005 854										
Flush Gage Reading, in001 Capacitance Gage Reading 240 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -12 0 -12.0 -13.0 -14.0 -12.0 -12.0 -13.0 #2 4.0 3.0 2.0 3.0 4.0 4.0 3.0										
13 6.C 5.0 5.0 5.C 5.C 4.0 5.0 14 6.0 5.0 5.0 5.0 5.0 4.0 15 7.0 6.0 6.0 7.0 6.0 5.0 5.0										
Hole #2 Surface Finish, AA 100 Bluing Pin Rollout										
Protrusion, in. 168 Perpendicularity, .001 in./in.										
Longitudinal 10015 Transverse 006  Flush Gage Reading, in. 2002  Capacitance Gage Reading 241  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -12.0 -13.0 -13.0 -14.0 -8.0 -7.0 #2 4.0 4.0 3.0 3.0 3.0 3.0 4.0										
13 6.0 6.0 5.0 4.0 5.0 3.0 4.0 14 6.0 5.0 5.0 4.0 4.0 3.0 4.0 15 70 6.0 6.0 4.0 4.0 6.0 6.0										

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	ries 2/ n No. 4/24'-	Qual	ity Var	lable S	111:3.	6-1-1. N1. 12	1 1/20 T 17/20	<u>5000 .</u> h			
<u> </u>	Hole Manufacturing Conditions and Procedures:										
Prot Perp L Flus Capa	Surface Finish, AA 103  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .0015 Transverse 1031  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.										
Air Gage Readings (,0001 in,) Angular Position											
	Axial Position	00	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	3.0 3.0 3.0	-/3 ) 3 ) 5 ) 5 ) 7 0	75 J 3.0 4.0 4.0 7.3	3 2 3 2 4 0 4 0 7 3	-13.0 3.0 5.0 4.0	-12 0 3 0 5:0 5:0 6:2	-//.) 3.0 4.0 3.0 7.0			
Proti	nce Finish, outline, in.	727	0	Hole #2		Blui	ing Pin I	Rollout			
Flush Capac	ongitudinal Gage Readi Citance Gage Burr Height	ng, in. Reading	Transve	rse ( <u>(</u> )		oh	12 <u>1</u>				
		Δ	ir Gage Angu	Reading		1 in.)		·			
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2	-// <u>2</u> 3.0	-/:0	20	-13.0 3.0	-11.7	-13.0	-//.0 3.0			
	#3 #4 #5	11.7	40	3/3	5.0	50	40	42			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries 21	Qual	ity Var	iable 5	110.21	5 19 1019 0° 12 1	KIN	SCOIPTCh			
Spin	nufacturing  ///// /// /// /// /// /// /// /// //	Conditi RECONDED	ons and	L puil	011 + 1° eed:	CR SC	13.4 - 13.3 2. 3. 4. 1. 1.3.3				
Surface Finish, AA 100  Protrusion, in. 180  Perpendicularity, .001 in./in.  Longitudinal 1000. Transverse 10015  Flush Gage Reading, in.											
Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	10.0 3.0 5.6 40 7.6	-20 30 40 40 80	7.0 2.0 4.0 4.3 7.0	-7.0 3.0 4.0 4.0	10.0 3.0 4.	11.0 2.0 4.0 3.0 5.0	-13 0 2.0 4 C 4.0 5.0			
Protr	ce Finish, A	175	0	Hole #2		Blui	ng Pin	Rollout			
Flush Capac	endicularity ongitudinal o Gage Readir citance Gage Burr Height	<u>002</u> ng, in. Reading	Transve	rse , <u>00</u>	<u>15</u> 89	colo					
EXIL	burr nergit,	_	ir Gage Angu	Reading lar Posi		1 in.)		÷			
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	#3 #4	-100 1.0 5.0 5.0	1.0	3.0 4.0	3.0	-9.0 4.0 4.0	-11.0 2.0 4.0	-12.0 1.0 4.0 40			
}	#5	20	7 3	7.5	2.0	4.6	5.2	4.0			

MANUFACTURING REPORT: TAPERED HOLES										
Specimen No. 30/36 840336 Ann Tril. 1257 8										
Hole Manufacturing Conditions and Procedures: Ring Happing 25										
Prot Perp Lo Flusi	Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal 1005 Transverse 1005  Flush Gage Reading, in.  Capacitance Gage Reading 226									
Exit Burn Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	00	45°	90°	180°	225°	270°	315°		
	Bottom #1	14.0	-13:0	130	-13.6	-13.0 3.0	-12.0	-14.0		
	#3	51.0 51.0	5.0	5.0	4.0 3.0	4.0	5.0 40	40		
·	/5	60	16.0	1 6 0	13.0	18.2	15.0	16:0		
Protr Perpe L Flush Capac	Surface Finish, AA / 5 Bluing Pin Rollout Protrusion, in. 121 Perpendicularity, .001 in./in. Longitudinal 10015 Transverse 1015 Flush Gage Reading, in. Capacitance Gage Reading 238 Exit Burr Height, in.									
-		<u>A</u>		Reading ar Posi		in.)		;• <b>4</b>		
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Position       0°       45°       90°       180°       225°       270°       315°         Bottom #1       -/3.0       /4.0       -/2.0       -/1.0       -/2.0<									

MANUFACTURING REPORT: TAPERED HOLES										
Test Series Z/ Quality Variable SURFESE Notion SCRATCH Specimen No. 1027C L 243+C M. U.T. 125 RMS										
Hole Manufacturing Conditions and Procedures: READS UNDER THE REPORT OF READS AND REPORTS  Spindle, rpm 80 Feed: F. F. F. F. F. F. F. F. F. Cutting Fluid: DRY Depth: (Ind. Reading) 2.440										
Surface Finish, AA //O  Protrusion, in. //S  Perpendicularity, .001 in./in.  Longitudinal .00/ Transverse .0005  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
Angular Position Axial										
Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -13.0 -14.0 -13.0 -13.0 -12.0 -13.0 -13.0 #2 4.0 3.0 3.0 3.0 3.0 4.0 4.0										
#3 5:0 5:0 4.0 5:0 4.0 5:0 5:0										
#4 5.0 5.0 3.0 4.0 4.0 5.5 5.0 #5 60 60 60 60 60 60 60 60										
Surface Finish, AA 95 (50)  Protrusion, in. ///  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse 0  Flush Gage Reading, in001  Capacitance Gage Reading 258  Exit Burr Height, in.  Air Gage Readings (.0001 in.)*  Angular Position										
Axial										
Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -/3.0 -/3.0 -/3.0 -/5.0 -/3.0 -/3.0 -//.) #2 3.0 3.0 2.0 3.0 4.0 4.0 4.0										
#3 5.0 5.0 5.0 4.0 5.0 40 5.0										
#4 5:0 5:0 4.0 40 5:0 40 5:0										

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 21 Quality Variable Summer Production A Transport Specimen No. MAZZ - GRIPC ATIO INT. 125 A										
Hole Manufacturing Conditions and Procedures: RERM WITH UPDER -  SIEF REPORT 1.755 REP. McD. L.H. SE. REL BER. S.A.  USE Manufacturing Conditions and Procedures: RERM WITH UPDER S.A.  Spindle, rpm FO Feed: F. F. F. F. F. F. F. F. F. F. F. F. F.										
Surface Finish, AA //5-/23 Bluing Pin Rollout Protrusion, in. /75 Perpendicularity, .001 in./in. Longitudinal /001 Transverse / 001 Flush Gage Reading, in. Capacitance Gage Reading 188										
Exit Burr Height, In.  Air Gage Readings (.0001 in.)  Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -9.0 -8 C -1G.2 -1G.C -9 O -6 O -1G C #2 2.2 6 O 7.6 4.0 5.0 7.6 7.6 7.6 7.6 7.6 7.6 7.6 7.6 7.6 7.6										
Hole #2										
Surface Finish, AA //O Protrusion, in. /60 Perpendicularity, .001 jn./in. Longitudinal .0.05 Transverse .000; Flush Gage Reading, in. Capacitance Gage Reading 280 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 -/C.0 -8.0 -6.0 -//.0 -9.0 -x2 -// #2 6.0 6.0 7.0 5.0 7.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8										

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable SUNFACE - ROUTHNESS - RIFLING Specimen No. 3A3BC - 2A5BC N10- INT. 125 R115											
Hole Manufacturing Conditions and Procedures: REPA WITH UNAFIL- SIZE REPORT 1.755 REPORT 1930 L.H. SUIND REPORTS  USE ACOUNTY REPORT 19454-19455-1945 PC 1819/17  Spindle, rpm 80 Feed: SERENIT Depth: (Ind. Reading) 2,450											
Hole #1  Surface Finish, AA /20  Protrusion, in. /68  Perpendicularity, .001 in./in.  Longitudinal 100/ Transverse 1001											
Flush Gage Reading, in. 1001 Capacitance Gage Reading 247 Exit Burr Height, in.											
Air Gage Readings (.0001 in.) Angular Position											
Axial Position	Axial										
Bottom #1 #2	3.0	5:0	70	10.6	-120 3.0	5.0	-10.0 5.0				
#4	5.0	10	17 6	7.0	7.6	80	16				
Surface Finish,	AA 29		Hole #2		Blui	ng Pin I	Rollout				
Protrusion, in. Perpendicularity Longitudinal Flush Gage Readi Capacitance Gage Exit Burr Height	ng, i Reading	Transver	rse , <u>00</u>		10%						
Air Gage Readings (.0001 in.) Angular Position											
Axial Position											
Bottom #1 #2	-9.0 6.0	-12.0	-10.0 4.0	-12.)	-90 6.0	-9.0 5.0	-11.0				
#3 #4 #5	40	30	50	4.0 3.0 5.0	5.0 4.0 5.0	3.0 3.0 4.0	5.0 5.0				

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable SUBJECTION No. 10386-3167 PAID TWT. 188 1875											
Hole Manufacturing Conditions and Procedures: RIPS WITH UNITED SIDE REPORT ASSESSMENT AS											
Cutting Fluid: Dry Depth: (Ind. Reading) 2.450											
Surface Finish, AA 95-100 Bluing Pin Rollout											
Protrusion, in. 174 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .003 Flush Gage Reading, in. 0											
	citance Gage Burr Height		374			,					
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270°										
	Bottom #1	-20	11.0	-4.0	150	11.0	10.6	8			
	#2	5.0	3. C	8.0	3. C	10	6.0	6.0			
	#4	5.0	7.0	30	10	1.0	5.0	2.0			
			ŀ	lole #2							
	nce Finish, A		100			Blui	ng Pln I	Rollout			
Perpo U Flusi Capac	endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 i <u>10005</u> ig, in. Reading	Transver . 002	·se	- 2 10	d					
	•	_		Reading ar Posi	s (.000 tion	1 in.)		_			
	Axial Position 0° 45° 90° 180° 225° 270° 3										
	Bottom #1	10.0	-9.0	80	-10.0	-11.0	-7.0	-10.0			
	#2	5.0	6.0	20	3.0	4.0	5.0	7.0			
	#4 #5	5.0	60	50	40	40	6.0	40			
	L	4.0	- 6	1.0	1.7	11111	<u> </u>				

MANUFACTURING REPORT: TAPERED HOLES											
Test S Specim	Test Series 21 Quality Variable Suproci Rouse Mass. Biffing Specimen No. 3CIFC - 6BIB 1910- FAT. 125 1715										
Hole Manufacturing Conditions and Procedures: READ V. TH. UPATRIC SIZE REPORT 1.755 READ MOD. L. H. Sp. Red READ REPORT.  WSL MOD L. H. Sp. 121 READ REDUST 180 MODERNIA 180-500 Pa REDIO.  Spindle, rpm 80 Feed: Size REDIO.  Cutting Fluid: DRY Depth: (Ind. Reading) 2.450											
Hole #1											
Surface Finish, AA 100 Protrusion, in. 165 Perpendicularity, .001 in./in. Longitudinal 101 Transverse, 0015 Flush Gage Reading, in002 Capacitance Gage Reading 268 Exit Burr Height, in.											
		- A	ir Gage	Reading	gs (.000	1 in.)	•				
		<del>-</del>		lar Pos		<del></del>	<del></del>				
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-80	-10.0	-70	-100	-9.0	-60	-10			
	#2	30	6.0	20	5.0	2.0	16.2	3.0			
	#4	20	5.0	4.0	40	23	30	25			
	#5	2.0	6.0	4.0	5.0	7.0	20	8.0			
Prot Perp Flus Capa	Surface Finish, AA 100-105  Protrusion, in. 163  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse .0025  Flush Gage Reading, in. Capacitance Gage Reading 297  Exit Burr Height, in.										
		<u>A</u>		Reading ar Posi	s (.0001 tion	in.)		Principle Self of Lineary			
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4	6.0 6.0 6.0	-/1.1 6.0 6.0	-10 0 6.0 7.0 7.0	-9.0 6.0 6.0 5.0	11.0 6.0 6.0 3.0	7.0 8.0 7.0 6.0	-10.0 2.0 4.0			
	#5	7.0	7.0	80	5.0	5.0	7.0	7.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 2/ Quality Variable Sulling E.R. 12 HMTS - 17, Fl9 Specimen No. 405 40686 M. O EMP. 125 Reco										
Hole Manufacturing Conditions and Procedures: Rear with United Size Rear ER 1733 Representations and Procedures: Rear with United Size Rear ER 1733 Representations and Procedures: Rear with United Spindle, rpm Spi										
Surface Finish, AA 100-105 Protrusion, in. 174 Perpendicularity, .001 in./in. Longitudinal .0 Transverse 10005 Flush Gage Reading, in. Capacitance Gage Reading 292 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
į,	Axial Position 0° 45° 90° 180° 225° 270° 315°									
В	Nottom #1 #2 #3 #4	-8.0 2.0 8.0 8.0 10.0	-7. 3 8. 3 8. 0 8. 0	-8.0 7.0 8.0 10.0	70	-8.0 6.0 5.0 7.0	-4 c 9.0 8.6	-20 80 70		
Surface Finish, AA /25 Protrusion, in. /67 Perpendicularity, .001 in./in. Longitudinal ,0005 Transverse ,0005 Flush Gage Reading, in001 Capacitance Gage Reading 297 Exit Burr Height, in.										
	Air Gage Readings (.0001 in.)  Angular Position									
	Axial osition	0°	45°	90°	180°	225°	270°	315°		
Bo	#3 #4 #5	5. V 3. O	-8.0 5.0 3.0	7.0 7.0 3.0	-9.0 6.0 6.0	80 80 8.0	-5.0 8.J 7.0 10.D	70		

	MANUFACTURING REPORT: TAPERED HOLES										
Test Series 21 Quality Variable Sunface Rollings Relies Specimen No. 40370 430486 M. Twt. 12:11:15											
Hole Manufacturing Conditions and Procedures: //E 404 (INC) ZE  /// (1.125) 15 // 1 25 // Spinol 7 // 10 (1.55)  Spinole, rpm											
Surface Finish, AA 100 Hole #1  Protrusion, in. 776  Perpendicularity, .001 in./in.  Longitudinal .000 Transverse .001  Flush Gage Reading, in. 0  Capacitance Gage Reading 293  Exit Burr Height, in.											
Air Gage Readings (.0001 in.)											
	Angular Position ,  Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2 #3 #4 #5	-12 Q 4.0 5.0 5.0 5.0	-//.2 4.0 5.0 5.0 5.0	-13.0 40 5.0 5.0	13 3 5 5 4.6 4.0	3.0 3.0 3.0 3.0	-1/ C 4 C 6 C 5, 2 4 3	4:			
Proti Perpe l	ace Finish, / rusion, in. endicularity Longitudinal	170 , .001 i 0	n./in. Transve			,	ng Pin	Rollout			
Capac	n Gage Readir citance Gage Burr Height	Reading	76		_ 8: _	S)		-			
		<u>A</u>	ir Gage Angu	Reading Iar Posi		<u>1 in.)</u>					
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3	-12.0 4.0 5.0	-7.0 3.0 5.0	-12.0 4.0	-X.0 3.0 4.0	11.0	-12 0 4.0 5.0	-11.2 4.2 5.0			
	#4 #5	3.0	50	4.0	4. 3	40	40	4.0			

MANUFACTURING REPORT: TAPERED HOLES									
Test Series 2/ Quality Variable Support Roughows P. J. J. Specimen No. 60666 138586 A. T. T. 125 Re-									
Hole Manufacturing Conditions and Procedures: REPM NOVERS 5-21-  REPLIED 1955. REPM 1950 L.H. CO. S. REPARTY  USE 10-10 L.H. CR. COLL REPORT & Feed: 15 F. I.M.  Spindle, rpm FO Feed: 15 F. I.M.  Cutting Fluid: DRy Depth: (Ind. Reading) 1440									
Surface Finish, AA 95 123  Protrusion, in. 160  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse 0  Flush Gage Reading, in. 0  Capacitance Gage Reading 295  Exit Burr Height, in.									
	<u>!</u>	Nir Gage Angu			<u>1 in.)</u>				
Axial Position	Angular Position  Axial Position 0° 45° 90° 180° 225° 270°								
Bottom #	2 2.0 3 3.0 4 2	-16 0 3 5.0 4 0 40	-14.0 3.0 3.0 4.0	-/5.0 3.0 40 40 40	3.0 4.0 3.0 3.0 3.0	-10: 3: 4:2 4:0 3:2	-/3.0 3.6 5.0 5.0 4.0		
Surface Finish Protrusion, in Perpendiculari Longitudin Flush Gage Read Capacitance Gag Exit Burr Heigl	. <u>175</u> ty, .001 i nl <u>.001</u> ding, in. ge Reading	n./in. Transver			,	ng Pin (	Rollout		
	<u>A</u>	ir Gage Angul	Reading ar Posi		in.)		,*.		
Axial Position	0°	45°	90°	180°	225°	270°	315°		
Bottom #1 #2 #3	5 Q 4.2	-13.0 3.0 5.0 5.0 4.0	-13.2 4.0 6.0 5.0	15.0	-13 3 2.0 4.0 4.0 5.0	-/1.0 40 5.0 5.0 5.0	-12.0 4.0 5.0 5.0 4.0		

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable SURFACE-ROUGHNESS-B.Fliry Specimen No. GBIT & GBCBC MIO-FNT. 1258.											
Hole Manufacturing Conditions and Procedures: REAM UNDER S. 21  REAM SIN 1.755 REAM MODELL. Sp. 031 REAM UNDER S. 21  Spindle, rpm 80 Feed: Self Fp. 10.  Cutting Fluid: DR. Depth: (Ind. Reading) 2440											
Surface Finish, AA //3-//> Protrusion, in. //3 Perpendicularity, .001 in./in. Longitudinal . 2 1 Transverse O Flush Gage Reading, in											
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	73.0 40 40 40 40	-12 0 3 0 5 0 4 0 4 0	-14.0 3.0 5.0 6.0 5.0	-14.0 2.0 4.0 4.0 4.0	·14.0 2.0 4.0 3.0 4.0	-13.2 4.0 57.2 4.0	-14.0 3.0 4.0 3.0 4.0			
Proti Perpe L Flush Capac	Surface Finish, AA // -/2 Bluing Pin Rollout Protrusion, in. /60 Perpendicularity, .001 in./in. Longitudinal O Transverse .0015 Flush Gage Reading, in001 Capacitance Gage Reading 302 Exit Burr Height, in.										
		<u>A</u>		Reading ar Posi	s (.0001 tion	in.)					
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	#2 #3 #4 #5	-14.0 4.0 5.0 4.0 3.0	4.0 5.0 4.0 3.0	-14.0 4.0 5.0	-14.0 4.0 4.0 4.0 4.0	- 3.0 4.0 3.0 3.0	-10.0 5.0 5.0 3.0	-14.0 4.0 4.0 3.2 3.0			

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable SUNTER - P. 196 (1855 - 1874) Specimen No. 31112225 UC NO CIME 185 RMS											
Hole Manufacturing Conditions and Procedures: RET. UNDER 1.25 RIPM ASSOLE SI AND LAST VIEW Spindle, rpm Feed: Feed: France Cutting Fluid: 100 Depth: (Ind. Reading) 2.440											
Surface Finish, AA 90  Protrusion, in. 75  Perpendicularity, .001 in./in.  Longitudinal 1001 Transverse 150  Flush Gage Reading, in.											
	citance Gage Burr Height		19.	)			(Manage	· •			
Air Gage Readings (.0001 in.) Angular Position											
	Axia1 Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2 #3	13.0 3.0 4.0	120	12.0	140	-140 20	72.0	-//. J 3. G 4. O			
	#4	3.0	3.0	4.0	3.0	3.0	3.0	3.0			
Prot Perpo Flus Capac	Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal : Transverse : 5:  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.										
	Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2 #3	-13.0 4.0	-13.2 4.0 4.0	-14.0 4.0 5.0	-14.0 2.0 5.0	-14.0 3.0 5.0	-13.0 4.0 4.0	-14.0 4.0 4.0			
	# L	3.0	4.0 5.0	5.0	5.0	5.0	4.0	4.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 21 Quality Variable SURFACE ROUGHNESS. M.Fling Specimen No. 3EGREGETT MIN. INT. 1258313										
Hole Manufacturing Conditions and Procedures: REPAIRE SIZE  REAR A 1722. REAR 1820. Left SRICE REPAIR USE  NOW Left SO WAS REAR 1820. Left SRICE REPAIR USE  Spindle, rpm 80 Feed: FRIPM  Cutting Fluid: DP Depth: (Ind. Reading) 1440										
Hole #1										
Surface Finish, AA /60 Protrusion, in. /75 Perpendicularity, .001 in./in. Longitudinal /0005 Transverse /0005 Flush Gage Reading, in. /00/ Capacitance Gage Reading 297 Exit Burr Height, in.										
	Air Gage Readings (.0001 in.)									
	Axial	1	Angu	lar Posi	tion	1	<u> </u>	•		
	Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-11.0	-12.0	120	12.0	12.0	-130	-12.0		
	#2	4.0	4.0	4.0	5.0	4.0	3.0	3.0		
	#4	3.0	3.0	3.0	5.0 5.0	4.0 5.0	4.0 5.0	3,0 3.0		
Protr Perpe L Flush Capac	Surface Finish, AA // 0  Protrusion, in. // 0  Perpendicularity, .001 in./in.  Longitudinal .00/ Transverse .00/ Flush Gage Reading, in									
		<u>A</u>	ir Gage Angul	Reading ar Posi		in.)				
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	140 -	13.0	12.2	-13.0	-11.0	-13.0	-/4.0		
	#2	4.0	4.0	3.0 5.0	3.0 4.0	3.0	3.0 4.0	3.0		
	#4 #5	4.0	3.0	3.0 3.0	40	4.0	40	40		

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable Summer Routhwise OVALLY Specimen No. 3868-683+6 M. Q. Int. 125 M. V.											
Hole Manufacturing Conditions and Procedures: REHM UNCL 5,21  REAL LIPERS AND AND SOLAR REMARKATION USE  STREAM FINITE REAL A DIMAGE LIPE 2006 (A TRANSPACE BS.  Spindle, rpm RO Feed: Fred: P. C.  Cutting Fluid: Off Depth: (Ind. Reading) 2440											
Surface Finish, AA 126 Protrusion, in. 164 Perpendicularity, .001 in./in. Longitudinal .coc5 Transverse 0 Flush Gage Reading, in1001											
Capa	citance Gage Burr Height	Reading , in	234								
325	Air Gage Readings (.0001 in.) Angular Position										
/3/9	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	-7.0	-7.0	-7.0	-8.0	-70	-90	-90			
·	#2	8.0	9.0	13.0	6.C 5.C	8.0	11.0	8.0			
	#4	11.0	13.0	15.0	40	13.0	15.0	14.0			
_	#5	110	13.0	13.0	11.0	12. 7	13.0	11.0			
Prot Perp Flus Capa	Surface Finish, AA 100-105 Bluing Pin Rollout Protrusion, in. 160 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .0015 Flush Gage Reading, in. Capacitance Gage Reading 231 Exit Burr Height, in.										
325		<u>A</u>	ir Gage Angul	Reading ar Posi		1 in.)					
3//	Axial Position	0°	45°	90°	180°	225°	270°	315°			
		-7.0	-7.0	-7.0	-90	-8,0	*y <sup>2</sup> .0	-10.0			
	#2	8.8	5.0	11.0	6.0	110	13.0	10.0			
	#4	100	13.5	15.6	7.0	15.0	15:0	13.0			
	#5	12.7	11.0	13.0	12.0	2.0	10.0	12.0			

	MA	NUFACTU	RING REP	ORT: T	APERED I	IOLES				
Test Series 21 Quality Variable SURFACE-ROUPH INTES-OUTLITY Specimen No. 3E2BC-4B6TC NO. Jak. 125 Processing										
Hole Manufacturing Conditions and Procedures: REAM UNDEN. SIZE										
REAMER 1.755 REAM MOD. L.H. SP. RAI REAMER USE STRIGHT FINTE REAMER PINNEL 1.700 E.OOL IN TRANSVERSE PAS										
Spindle, rpm 80 Feed: State 1777. Cutting Fluid: ORY Depth: (Ind. Reading) 2,440										
Hole #1 Surface Finish, AA /25 Bluing Pin Rollout										
Prot	rusion, in.	177			<del></del>	BIU	ing rin	KOTTOUT		
L	endicularity ongitudinal	COL T	ransver	se <u>.00/</u>	5	d				
	h Gage Readi cit <b>a</b> nce Gage			0	7	ol	+			
Exit	Burr Height	, in					!	(see		
		<u>A</u>	ir Gage Angu	Reading lar Posi	s (.000	1 in.)		· · · · · · · · · · · · · · · · · · ·		
325	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-6.0	-5.0	-7.0	-8.0	-5.0	-8.0	-6.0		
	#2	8.0	14.0	14.0	5.0	13.0	13.0	8.0		
	#4	120	140	140	8.0	140	13.0	14.0		
	#5	13.0	14.0	7.0	13.0	140	1//. 0	1/4.0		
	ice Finish, A			lole #2		Blui	ng Pin	Rollout		
	rusion, in. endicularity,		n./in.							
L	ongitudinal.	1001		se .00		1		· I		
	n Gage Readin :itance Gage		254		_ 6 <sup>4</sup>					
	Burr Height,									
319	Air Gage Readings (.0001 in.) Angular Position									
,,,	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	7.0	-8.0	.6.0	-10.0	7.0	-8.0	-7.0		
	#3	8.0	80	8.0	5.0	8.0	8.0	7.0		
ŀ	74	12.0	15.0	14.0	5.0	13.0	15.0	12.0		
	#5	11.0	12.0	13.0	11.0	11.0	12.0	13.0		

	MANUFACTURING REPORT: TAPERED HOLES										
Test Series 21 Quality Variable SUNCACE - ROUSHMESS - CVALLEY Specimen No. SEIT=6184 A4.0.INT. 125 181-5											
Hole Manufacturing Conditions and Procedures: REA: UNDIN 5, 2E  REMAIN 1. 1.755. REAM MODE LAND SOUTH RECEER. USE  STATES - 11822 REAMEN PHONE 1.700 I TO GEN TRANSVERIE POS.  Spindle, rpm & Feed: TETUNG  Cutting Fluid: DIX Depth: (Ind. Reading) 2,442											
Sue	Hole #1										
Surface Finish, AA 96-100 Protrusion, in. 168 Perpendicularity, .001 in./in. Longitudinal O Transverse O 60											
	citance Gage Burr Height		237	7	<del></del>						
	J.	_	ir Gaoe	Reading	 as (.000	: (.ai 10	- 1341				
322		<u>-</u>		lar Pos			<del></del>				
319	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 -2.0 -5.0 -2.0 -7.0 -6.0 -5.0 -6.0										
	#2	8.0	12.0	7.0	30	7.0	13.0	9.5			
	#4	9.0	13.0	13.0	3.0		15.0	175			
	#5	12.0	13.0	11.3	1/2.0	13.0	10.0	17.0			
Prot Perp Flus Capa	Hole #2  Surface Finish, AA //O Bluing Pin Rollout  Protrusion, in. //2  Perpendicularity, .001 in./in.  Longitudinal .001 Transverse .000  Flush Gage Reading, in.  Capacitance Gage Reading 216										
Exit	Burr Height,	in						-;			
327	Air Gage Readings (.0001 in.)  Angular Position										
10701	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2 #3 #4	7.0	-8.0 8.0 13.3	-9.0 11.0 14.0	-6.0 6.2 2.0	9.0	-6.0 11.0 14.2	-6.0 7.0 12.0			
	#4	12.0	14.0	150	133	14.0	13.0	19.0			

	М	ANUFACTU	RING RE	PORT: 1	APERED	HOLES						
Test Se Specime	Test Series 11 Quality Variable Surface Roughous - Ouplity Specimen No. 3CEBC-163BC Mi.O. Int. 125 RMS											
Hole Manufacturing Conditions and Procedures: REMIT UMBER SIZE  REACTER 1755 REAK, MOD L.th. Sp. RAI RITTO II - US C.  STR. 944 FINAL REAMER DIVINGE 1.200 FOOL OF TRAVERSE POS.  Spindle, rpm RD Feed: SS X J. P. Ma.  Cutting Fluid: DRY Depth: (Ind. Reading) 2,440												
Surface Finish, AA //O  Protrusion, in. /5  Perpendicularity, .001 in./in.  Longitudinal 1001 Transverse O  Flush Gage Reading, in.  Capacitance Gage Reading 283  Exit Burr Height, in.												
		4		Readin		1 in.)		-				
3/-	Axial Position	0°	45°	90°	180°	225°	270°	315°				
) <b>-</b> -	Bottom #1 #2 #3 #4	-90 50 76 60 90	-80 9.0 15.0 /6.7	-1C.0 5:2 11:0 13:0 13:0	130 40 5 3.0 5.0	-11.0 5:0 2.0 7.0	10.2	-8.C				
Proti Perpe l Flush Capac	ace Finish, rusion, in. endicularity ongitudinal n Gage Readi citance Gage Burr Height	/78 , .001 i .101 ng, in. Reading	n./in. Transve	Hole #2		Blui GoV	ng Pin	Rollout				
319		<u>A</u>		Reading lar Posi		1 in.)		,				
326	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1 #2	-11 O	-7 c	-6.c	-6.0	-7.0 8.0	-10.0 1.6	-//.0				
	#3	11.2	140	15.0	50	12.0	13.0	13.3				

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable SURFACE ROUGHNESS : OVALITY Specimen No. 30286-3627 NO INT. 125 R.M.S											
Str. Str. Spin	Hole Manufacturing Conditions and Procedures: REPLA UNDER SIZE  REPLAN 1955 REPLAN 1950 Lift SPIRE REPLANT - USE  Strick Flut Britania Plunge 1900 Lock in the spire Pas.  Spindle, rpm PO Feed: PRIP. No.  Cutting Fluid: DRY Depth: (Ind. Reading) 1,440										
Surf	Hole #1										
Surface Finish, AA //O Bluing Pin Rollout Protrusion, in. /62 Perpendicularity, .001 in./in. Longitudinal .coes Transverse .oo/ Flush Gage Reading, in. O 70 Capacitance Gage Reading 228 Exit Burr Height, in.											
325	/	A		Reading		1 in.)	i				
517	Angular Position										
	Bottom #1	-70	-6.0	-5.0	-90	-7.0	-6.0	-5.0			
	#2	7.0	13.0	13.0	2.6	12.0	14.0	9.0			
	#4	13.0	15.0	14.0	12.0	12.0	12.0	14.0			
Prot Perpo Flusi Capad	Surface Finish, AA 95-100  Protrusion, in. /7/ Perpendicularity, .001 in./in.  Longitudinal 1001  Transverse .0005  Flush Gage Reading, in. 1001  Capacitance Gage Reading 236  Exit Burr Height, in.										
324	Air Gage Readings (.0001 in.)  Angular Position										
J . 1	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2	-9.0 6.0	70.0	-8.0	-10.c	9.0	-8.0	-8.0			
	#3	7.0	13.0	14.0	6.0	13.0	14.0	12.0			
	#5	13.0	13.0	13.0	90	11.0	12.0	11.0			

	MA	NUFACTU	RING REF	ORT: T	APERED I	IOLES	,				
Test Series 21 Quality Variable SUBFREE ROUMNESS- OVALITY Specimen No. 6046 4385BC MIV. INT. 125RMS											
Hole Manufacturing Conditions and Procedures: PARM UNDER 3 212  NELLOW FO' 1855, REHIN 1800 6.H. Sp. 100, 18 EPN AN USE  Str Flat Report A' DISTABLE 1800 1 M FRANCE 1805.  Spindle, rpm 80 Feed: FRANCE 1800 1 M FRANCE 1805.  Cutting Fluid: 1807 Depth: (Ind. Reading) 2 440											
Surface Finish, AA //O Bluing Pin Rollout											
Protrusion, in. /68 Perpendicularity, .001 in./in. Longitudinal O Transverse 10005 Flush Gage Reading, in001 Capacitance Gage Reading 249 Exit Burr Height, in.											
	Air Gage Readings (.0001 in.) Angular Position										
318	Axial Position	0°	45°	90°	180°	225°	270°	315°			
13-1	Bottom #1 #2	-9.0 4.0	· j ]	- 2.0 2.5	-6.U	.6.0	·6.0 9.0	-6.0 8.0			
	#3 #4 #5	7.0	8.0 11.0	14.0	10.0	12.0	13.0	11.0 13.0 13.2			
Proti Perpe	ace Finish, A rusion, in. endicularity, ongitudinal	.001 i	, n./in.	lole #2		Blui	ng Pin F				
Flush Capac	Gage Reading citance Gage Burr Height,	g, in. Reading	0		<u> </u>	5%	• ,				
312	•	<u>A</u>		Reading ar Posi		in.)	be note	and the same			
323	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	#2 #3 #4 #5	-5.0 8.0 10.0 13.0	-5.0 11.0 14.0 13.0	-5.0 12.0 15.0	-6.0 2.0 6.0 x.0	-9.0 6.0 11.5	90 30 30	7 C 16.0			

	МА	NUFACTU	RING REP	ORT: T	APERED H	IOLES							
Test Series 21 Quality Variable SURFACE ROLANNESS OURILTY Specimen No. 3 KIS - 4638 125 KMS													
Hole Manufacturing Conditions and Procedures: REFORMANCE USE  Still the Flate Resource Diving 1.700 2.006 for the modern 1995  Spindle, rpm  Cutting Fluid: DRY  Depth: (Ind. Reading) 2.440													
Surface Finish, AA  Protrusion, in. 176  Perpendicularity, .001 in./in.  Longitudinal O Transverse O  Flush Gage Reading, in002  Capacitance Gage Reading 253  Exit Burr Height, in.													
- 17/	,	<u>A</u>	ir Gage	Reading	s (.000	1 in.)							
319	Axial Position												
	Bottom #1 #2	-4.0 2.0	-5.0	-4.0	-5.0	-5.0	-5.0	-6.0					
	#3	8.0	10.0	10.0	3.0	7.0	10.0	6. C 9. 0					
	#5	11.0	12.0	12.0	11.0	12.0	12.0	11.0					
Proti Perpe l Flush Capac	Surface Finish, AA 100  Protrusion, in. 162  Perpendicularity, .001 in./in.  Longitudinal 1001 Transverse 0  Flush Gage Reading, in.  Capacitance Gage Reading 265  Exit Burr Height, in.												
318/	Air Gage Readings (.0001 in.) Angular Position												
321	Axial Position	0°	45°	90°	180°	225°	270°	315°					
	Bottom #1	-5.0	-5.0	-5.0	7.0	-6.0	-8.0	-6.0					
	#2	3.0 4.0	2.0 4.0	2.0 6.0	3.0	5.0	7.0	5.0					
	#4 #5	7.0	8.0	10.0	3.0	9.0	10.0	9.0					

	MA	NUFACTU	RING REF	ORT: T	APERED I	IOLES					
Test Series 21 Quality Variable SURFACE -ROYANESS - OVALLY Specimen No. 4867 1 1876 M.D. IM. 125.875											
Hole Manufacturing Conditions and Procedures: REPAR UNDER SIZE  READ A 1755 READ AND L.H. SPIRAL REPORT USE  State of Flore Report A Fibre 1700 E oct 1 M + BRANCHERSE DOS  Spindle, rpm BO Feed: 31 P FR 10  Cutting Fluid: DRV Depth: (Ind. Reading) 2445											
Cutt	ing Fluid:	DRY			epth: (I	nd. Rea	ding) 🔏	1440			
	ace Finish,		100	Hole #1		Blu	ing Pin	Rollout			
	rusion, in. endicularity		n./in.					•			
L	ongitudinal h Gage Readi	1001	ransver		<u> </u>	obo		•			
Capa	citance Gage	Reading	1002		6	V					
Exit	Burr Height	, in									
	Air Gage Readings (.0001 in.)  Angular Position										
3124	Axial Position	0°	45°	90°	180°	225°	270°	315°			
3-1	Bottom #1	-8.0	-7.0	-60	-5,0	-6.0	- 8.0	-7.0			
	#2	1.0	6.0	8:0	1.0	5.0	90	2.0			
	74	4.0	10.0	11.0	0	90	10.0	100			
	#5	9.0	10.0	11.0	7.0	100	11.3	10,0			
	nce Finish, A	Α/	10	lole #2		Blui	ng Pin I	Rollout			
	rusion, in. endicularity,	.001	n./in.	·							
•	ongitudinal	_		se .00	<u> </u>						
	Gage Readin		100			d		•			
	itance Gage Burr Height,		781		<del></del>	650		Miles (			
	,	_					•	, <b>.</b>			
217		<u>A</u>		Reading ar Posi		<u>in.)</u>					
3/1		-		<u> </u>		I					
313	Axial Position	0°	45°	90°	180°	225°	270°	315°			
,	Bottom #1	-9.0	-8.0	-5.0	·le ·	-8.0	-8.0	- 1/			
	#2	3.0	4.0	3.0	3.0	70	3.0	2.0			
}	74	4.0	9.0	10.0	3.0	12.0	11.0	4.0			
[	#5	9.0	7.0	10.0	7.0	11.0	12.0	90			

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 21 Quality Variable <u>SURFACE ROUSAMISS- OUNLITY</u> Specimen No. <u>3CSFC 431</u> 4fC											
Hole Manufacturing Conditions and Procedures: PERC MADIRE-12E    REAL REAL ROLL 120 TO TO TO TO TO TO TO TO THE POST Spindle, rpm 80 Feed: 5- 8-Ep. no.  Cutting Fluid: DOV Depth: (Ind. Reading) 2,440											
Surface Finish, AA  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal .00/ Transverse .001  Flush Gage Reading, in.  Capacitance Gage Reading  Exit Burr Height, in.											
21%	Air Gage Readings (.0001 in.) Angular Position										
3=1	Axial Position	00	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	10 3 70 70 10	12.0 12.0 12.0 13.0 16.7	-80 92 132 142 130	5.0 5.0 7.0 12.0	-5 0 5 11 13 0 11.0	-6 : 8: 0 12: 0 13: 0	10.0 2.0 10 12.0 11.0			
Prote Perpe l Flush Capac	Surface Finish, AA //O Protrusion, in. /70 Perpendicularity, .001 in./in. Longitudinal / Transverse / 0015 Flush Gage Reading, in										
312	Air Gage Readings (.0001 in.) Angular Position										
320	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	-80 50 100 100	-8'0 4.0 11.0 13.0 10.0	-9.0 7.0 13.0 14.0 13.0	-10 5.0 5.0 11.0	-90 40 11:0 12:0 11:0	-7.0 9.0 13.0 14.0 13.0	-9.0 2.c 11.2 13.0			

MANUFACTURING REPORT: TAPERED HOLES											
Specimen No. 61327 L SAUSC 1910 THE 125 NASS											
Hole Manufacturing Conditions and Procedures: BEAR UNDER-SIZE  REPARTALIZED REPARTS FIRE SOLUTION OF THE SOLUTION OF THE PARTY OF THE SOLUTION OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE SOLUTION OF THE PARTY OF THE SOLUTION OF THE PARTY OF THE SOLUTION OF THE PARTY OF THE SOLUTION OF T											
Prot Perp L Flus Capa	ace Finish, rusion, in pendicularity ongitudinal ach Gage Readinal dictance Gage	, .001 i , <u>001</u> T ng, in. Reading	// 0 n./In. ransver 	Hole #1	= = = \$5		ing Pin	Rollout			
	Exit Burn Height, in.  Air Gage Readings (.0001 in.)  Angular Position										
322	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4	-4.0 1.0 4.0 5.0	9.0 9.0 12.0	-3.0 2.0 7.0 10.0 12.0	-5.0 3.0 3.0 40 70.0	-60 2.0 5.0 100 11.0	-9.0 2.0 8.0 11.0 12.0	1.0 1.0 3.0 3.0 10.0			
Prot Perpo Flus Capac	ace Finish, A rusion, in. endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 in	160	se <u>. 0</u>	<b>9</b>	Blui	ng Pin A	ollout			
317		<u>A</u> 1		Readings ar Posis	s (.0001 tion	<u>in.)</u>		v			
3:11	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	#2 #3 #4 #5	-6.0 2.0 4.0 7.3	5.0 3.0 8.0 10.0	-9.C 3.0 8.0 10.0 11.0	-6.0 4.0 3.0 3.0	-8.0 4.0 8.0 10.0	7.0	3.2 7.0 10.0			

INSPECTION SHEETS FOR TEST SERIES 22 
COMBINED VARIABLES, REVERSE DOGBONE SPECIMENS

R RATIO = -0.33

	MA	NUFACTUR	ING REP	ORT: T	APERED H	OLES				
Test Se Specime	Test Series 12 Quality Variable SURFICE ROUGHNESS 1857's Specimen No. 60386468576									
<u>ئىرۇر</u> 17 ئىر Spli	Hole Manufacturing Conditions and Procedures: Reduct With United Size (1830) (1955) (1955) (1956) (1									
Perp L Flus Capa	face Finish, Acrusion, in. pendicularity congitudinal ch Gage Readin citance Gage Burr Height	, .001 i og, in. Reading , in.	n./in. ransvers 297	se <u>O</u>		t.	ng Pin	Rollout		
		<u>A</u>		Reading ar Posi	tion	<u>  in.) ''</u>		A Phone of the		
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	#2 #3 #4 #5	-9.0 3.0 5.0 4.0	-90 2.0 4.0 2.0 5.0	-11.0 1.6 3.0 1.0 4.0	4.0 4.0 3.0 2.0 4.0	-6.0 3.0 3.0 2.0	-7.0 4.0 4.0 3.0 4.0	-9.0 40 5.0 3.0 5.0		
Prot Perp Flus Capa	Surface Finish, AA 95-105  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal 10015 Transverse O  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	8ottom #1 #2 #3 #4 #5	-6.0 3.0 4.0 1.0 2.0	-5.0 3.0 4.0 3.0	-5.0 3.0 3.0 1.0	-90 10 20 30 50	10.4 1.0 2.3 4.0 4.0	10.0 1.0 2.0 <b>2.</b> 0 <b>4.0</b>	- î.o 3. C 4 O 3. O		

Figure 14 - Sample Manufacturing Report: Tapered Holes

	MA	NUFACTU	RING REP	ORT: T	APERED H	OLES					
Test Series 22 Quality Variable SURFICE REJENSES 125 Mars Specimen No. 3038643447C											
Spir	Hole Manufacturing Conditions and Procedures: Plant 19, 11, 11, 11, 11, 11, 11, 11, 11, 11,										
Perp L Flus Capa	ace Finish, rusion, in. pendicularity ongitudinal h Gage Readicitance Gage Burr Height	, .001 i ong, in. Reading , in.	n./in. ransver: 1001 27	7 Reading		, de	ng Pin				
	Avial	1	Angu	lar Posi	tion	1	1				
i	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1	-2.0	-5 0	-8.0	-60	-5.0	-7.0	-6.0			
	#2	3.0	2.0	3.0	4.0	6.0	5.0	6.0			
	#3	110	3.0	4.0	30	4.0	3.0	3.0			
	#5	6.0	20	6.0	5.0	2.0	3.0	5.0			
Prot Perpo Flus Capa	Surface Finish, AA /00-/10  Protrusion, in. /79  Perpendicularity, .001 in./in.  Longitudinal 10005 Transverse 1001  Flush Gage Reading, in. 1002  Capacitance Gage Reading 29/  Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 - 7.0 -30 -5.0 -6.0 -10.0 -7.0 -8.0										
	#2	2.0	5:0	4.0	3.0	2.0	2.0	1.0			
	#4	3.0	5.0	7.8	3.0	4.0	3.0	8			
	#5	40	4.0	1.0	5.0	6.0	5.1	2.0			

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>22</u> en No. <u>481+6</u>	Qual 1	ity Vari <i>GC</i>	able 54	IRFACE	Roux	spesi.	125/3		
Hole Manufacturing Conditions and Procedures: READ WITH UNTER- SIZE READ IN. 1.755 BEDIN 1900. L.H. Sp. 1131 Read CR										
Sp i n	Spindle, rpm 90 Feed: Feed: T.P. No. Cutting Fluid: DRY Depth: (Ind. Reading) 2.450									
	Surface Finish, AA //O-//> Protrusion, in. //2									
Perpendicularity, .001 in./in. Longitudinal .00/ Transverse .0005 00										
Capa	Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	4.0	-6.0	-8.0	-8.0	-7.0	-6.0	- F. U		
	#3	5.0	4.0 3.0	2.0	5.0	4.0	4.0	40		
	#5	3.0	4.0	13.0 101e #2	5.0	3.0	4.0	15.0		
Prot	ace finish, A rusion, in	123	5-10	5		Blui	ng Pin f	Rollout		
	endicularity, Longitudinal h Gage Readin	1001	Transver			1/2		2.5		
Capa	n dage keadin citance Gage Burr Height,	Reading	3/2		— 1 <sup>5</sup>			•		
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	-5'.0 4.0	-9.0	-9.0 1.0	-7.0 4.0	-8.0 4.0	-6.0 5.0	-\$.0 4.0		
	#3 #4	3.0	40	3.0 2.0	4.0	4.0 5.0	3.0	2.0		
	#5	50	4.0	3.0	3.0	5.0	5.0	3.0		

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries <u>22</u> n No. <u>26380</u>	Qual (	ity Vari	able <u>J</u>	uri v	1301	inves	<u>5 12517</u> 14		
Hole Ma Sバス	Hole Manufacturing Conditions and Procedures: Ream With United- SIZC 18020 CA. 1755 1312mm Near. L.H. SILIBI 18020104									
	Spindle, rpm 80 Feed: St & TP. 17. Cutting Fluid: D128 Depth: (Ind. Reading) 2450									
Surf	Surface Finish, AA /00 Bluing Pin Rollout									
Protrusion, in. //5 Perpendicularity, .001 in./in. Longitudinal Transverse O Flush Gage Reading, in001 Capacitance Gage Reading 318 Exit Burr Height, in.										
	Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1	-60	-6.0	- 7.0 5.0	-90	-9.0	10.0	-8.0 5.0		
	#3	40	4.0	3.0	2.0	2.0	2.0	40		
	#4	2.0	1.0	3.0	1.0	2.0	2.0	3.0		
	#5	1.0	4.0	4.0	4.0	3.0	3.0	4.0		
Prote Perpe l Flush Capac	Surface Finish, AA 100-110  Protrusion, in. 158  Perpendicularity, .001 in./in.  Longitudinal 0015 Transverse 0  Flush Gage Reading, in.  Capacitance Gage Reading Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
		10.0	-7.0	-8.0	-7.0	-8.0	-9.0	-5:0		
	#2	4.0	4.0	4.0	4.0	4.0	40	2.0		
l.	#3	4.0	3.0	2.0	3.0	40	2.0	2.0		
	#5	5.0	4.0	40	3.0	4.0	4.0	3.0		

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
	Test Series 22 Quality Variable Surious 12 10 10 10 10 10 10 10 10 10 10 10 10 10									
Specime	n No. 4010	Qual 1	ity Vari	able 🛴	URESC	<u> Sindj</u>	ک رمبر ط	12111		
Hole Manufacturing Conditions and Procedures: Mean With Under-										
Redair R Spindle, rpm 80 Feed: 58 11/1/2										
Cutting Fluid: 1184 Depth: (Ind. Reading) 2452										
Hole #1										
Surface Finish, AA 100-110 Bluing Pin Rollout Protrusion, in. 170										
Perpe	endicularity	, .001 i				.,		-		
Flush	ongitudinal h Gage Readii	ng, in.	ransvers	se <u>,00</u>	Ls a	oh	and the same of			
Capac	citance Gage Burr Height	Reading		3	_ <i>v</i>			-		
EXIT	burr neight	-						ing '		
Air Gage Readings (.0001 in.) Angular Position										
	Axial									
	Position	0°	45°	90°	180°	225°	270°	315°		
1	Bottom #1	-5.0	-1.0	-3.0	-5.0	-12.0	-9.0	-5.0		
	#2	7.0	6.0	5.0	4.0	4.0	4.0	6.0		
	#4	5.0	3.0	2.0	3.0	5.0	5:0	4.0		
	#5	6.0	4.0	3.0	14.0	7.0	6.0	6.0		
	<u> </u>			lole #2		7	- Di-	0-11-4		
Surfa	ce Finish, A usion, in.	164	,	· ·- ·- ·- ·	<del></del>	Blui	ng Pin	Kollout		
Perpe	endicularity,				<del></del>			, m <b>1</b>		
Flush	ongitudinal, Gage Readin	<u>a. in.</u>	ransver 1	se <u>O</u>	_ 90°	lo		- 14		
Capac	itance Gage	Reading	319		_	••		******		
Exit	Burr Height,	in			-					
		<u>A</u>	ir Gage	Reading	s (.0001	in.) ~	Web to	***		
r	Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1	-5.0	-4.0	-6.0	-9.0	-9.0	- ×.0	-7.0		
	#2 4.0 4.0 3.0 3.0 3.0 3.0 3.0									
	#3	2.0	4.0	0	5.0	5.0	3.0	3.0		
	#5	3.0	0	2.0	5.0	6.0	4.0	2.0		

Figure 14 - Sample Manufacturing Report: Tapered Holes

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 22 Specimen No. 60.512	Qual 1 4 60440	ty Vari	able 5	UPPP.	- 120. 17. 12	196 ME 5 RMS	55			
Hole Manufacturing Conditions and Procedures: REAM UNDEN-5, ZE. REAMER 1.755 REPAY NO C. L.H. SPINEL REAMER.										
Spindle, rpm 80 Feed: 5 8 T.P.V. Cutting Fluid: 0RV Depth: (Ind. Reading) 2440										
Hole #1 Surface Finish, AA Bluing Pin Rollout										
Protrusion, in. 176 Perpendicularity, .001 in./in.										
Flush Gage Readi	Flush Gage Reading, in									
Capacitance Gage Reading 265 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position	Axial									
Bottom #1	-100	-10.0	-20	7.0	-6.0	-7.0	.6.0			
#2	3.0	3.0	3.0	20	1.0	1.0	2.0			
74	4.0	5.0	3.0	1.0	1.0	2.0	2. 0			
#5	6.0	6.0	6.0	6.0	5.0	6.0	7.0			
Surface Finish, AA /00  Protrusion, in. /82  Perpendicularity, .001 in./in.  Longitudinal 100/5 Transverse 00/ Flush Gage Reading, in. Capacitance Gage Reading 3/3 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position										
Bottom #1										
#2	2.0	7.0	3.0	2.0	1.0	10	0			
#4	1.0	3.0	20	20	Ó	0				
#5	6.0	8.0	8.0	7.0	5.0	7.0	5,0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 22 Specimen No. <u>[R28</u>	Quali	ty Vari	able _{	URTA	E - 1	OUZA	. E. S.			
Hole Manufacturing Conditions and Procedures: BEANS UNDER 5.25 BERNA 1255 BERNA 1221 LIH. SPIRAL REPORTS										
Spindle, rpm SO Feed: S. F.M. P. P. Cutting Fluid: DAY Depth: (Ind. Reading) 2.440										
Surface Finish, AA 95 Hole #1  Protrusion in 759  Bluing Pin Rollout										
Perpendicularity	Protrusion, in. 758  Perpendicularity, .001 in./in.  Longitudinal .002 Transverse ()									
Flush Gage Reading, in.  Capacitance Gage Reading $322$										
Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
Angular Position Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1	15.0	-13 g 3.0	-14.0	-/2.0	10	12.0	-12.0			
#3	5.2	5.0 5.0	4.0	4.5	5.0 5.0	51.0	3. J 5. J 5. J			
#5	15.0	510 H	lole #2	40	6.6	0.0				
Surface Finish, Protrusion, in. Perpendicularity	171	/in			Blui	ng Pin f	Rollout			
Longitudinal Flush Gage Readir	<u>0005</u> T	ransver	se <u>00</u>	15 70°	b		. ``			
	Capacitance Gage Reading 303  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
Axial Position 0° 45° 90° 180° 225° 270° 315°										
Bottom #1 #2	-12.3 ·	130	-14.0 4.0	-8.0 2.0	-7.0 4.0	-8.J	-14.0			
#3 #4 #5	5 5 6 2	5.0 5.0	4.0	3.0 4.0 5.0	3.0 1.0	2.0 2.0 3.0	3.0 4.0 5.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>22</u> en No. <u>4277</u>	Qual	ity Vari ナ	able 52	111775	1. 12	SUGIA	15 53		
Hole Ma	nufacturing Species 1.753	Condition REA	ons and	Procedui	res: [	5000	la di pictoria	<u>-                                    </u>		
	Spindle, rpm 80 Feed: 15 F Cutting Fluid: 116 Depth: (Ind. Reading) - 440									
Surface Finish, AA 95 Hole #1 Protrusion, in. 170 Percendicularity 001 in /in										
Perpendicularity, .001 in./in.  Longitudinal .00/ Transverse .00/ Flush Gage Reading, in.  Capacitance Gage Reading 278										
Exit	Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-100	-10.0	-9.0	-8.0	-11.2	-11.0	-9.0		
	#2	20	3.0	3.0	4.0	2.0	3.0	3.0		
	#4	2.0	3.0	40	40	3.0	2.0	3.0		
	#5	60	7.0	6.0	8.3	6.0	6.0	8.0		
Proti Perpe l Flush Capac	Surface Finish, AA /05 Protrusion, in. 180 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .001 Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.									
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1	-120	-8.0	-7.0	-8.0		-8.0	-9.0		
	#2	3.0	5.0	4.0	3.0 5.0	3.0	3.0	3.0		
	#3	20	40	6.0	3.0	5.0	5.0	2.0		
ì	#5	510	7.0	9.0	5.0	8.0	7.0	6.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>22</u> en No. <u>6658</u> 6	Qual 3/3570	ity Vari	lable 5	URINE	r. 190.	17/1/V	er 55 J		
Hole Manufacturing Conditions and Procedures: Anti- United 21										
	Spindle, rpm 80 Feed: 5 8 FP 17 Cutting Fluid: 1889 Depth: (Ind. Reading) 2 446									
Prot Perp L Flus Capa	Surface Finish, AA //5  Protrusion, in. /26  Perpendicularity, .001 in./in.  Longitudinal .a0/ Transverse O  Flush Gage Reading, in. Capacitance Gage Reading So7  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 9.0 9.0 1.0 -6.0 -7.0 -7.0 #2 0 5.0 1.0 3.0 5.0 1.0 3.0 #3 3.0 3.0 3.0 3.0 5.0 1.0 3.0 #4 3.0 5.0 5.0 5.0 6.0 6.0 6.0									
Prote Perpe l Flush Capac	Surface Finish, AA //O Bluing Pin Rollout Protrusion, in. /83 Perpendicularity, .001 in./in. Longitudinal /00/5 Transverse /0235 Flush Gage Reading, in. /01/ Capacitance Gage Reading 308 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 5.0 -6.0 -6.0 -7.0 -5.0 -5.2 #2 1.0 4.0 4.0 5.0 3.0 3.0 9.0 #3 2.0 3.0 3.0 3.0 3.0 9.0 #4 3.0 3.0 3.0 7.0 3.0 9.0									
	#5	6 6	70	V 5	35	3.0	5.0	8.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test So Specime	eries <u>22</u> en No. <u>30210</u>	Qual 32117	ity Var	lable j	UR. B.	F 120.	191 1 E.	٧		
Hole Ma BEC	Hole Manufacturing Conditions and Procedures: Action of the Strain of th									
	Spindle, ipm School Coed: Station Cutting fluid: Depth: (Ind. Reading) 1990									
Surface Finish, AA 9 Bluing Pin Rollout										
Prot	Protrusion, in. /// Perpendicularity, .001 in./in.									
	ongitudinal h Gage Readi			se Q		il,		, management		
Capa	citance Gage	Reading	318		$\frac{1}{2}$	)				
Exit	Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225"	270°	315°		
	Bottom #1	-10.2	-11.0	10)	-10.0	-9.0	7.0	10.0		
	#2	20	20	5.0	3.0	3.0	3.0	3.0		
	#3	4.0	4.0	3.0	4.0	0	4.0	4.0		
	#5	5.0	4.0	5.0	4.0	3.0	5. ^	5,0		
· · · · · · · · · · · · · · · · · · ·				W. L. #2						
Surfa	ace Finish, A	AA //		Hole #2		Blui	ng Pin I	Rollout		
Proti	rusion, in.	173				e-t	andress	And Spinish and Sp		
	endicularity,				•	d				
	Longitudinal h Gage Readir		178115001	SC / 60	E 3	<i>, (1)</i>				
Capac	citance Gage	Reading								
Exit	Burr Height,	, in								
		Α	ir Gage	Reading	s (.0001	in.)				
				ar Posi						
I I	Axial									
	Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-14.0	-/2.0	-12.0	13,0	18.0	13.0	-14.0		
	#2	3.0	3.2		4.0	3.0	3.0	3.0		
	#3	3.0	6 3	5.0	5.0	5.0	5.0	5.00		
	#5	6.0	7.0	7:0	6.0	3.0	60	63		

	M	ANUFACT	IRING RE	PORT: 1	APERED	HOLES		
Test Se Specime	ries <u>22</u> n No. <u>3065</u>	Qual - 3 C 4	ity Var	lable 5	URFAC.	E-170U9	hress -	SCRA
Hole Ma Sizi USE Spin	nufacturing  [ ] [AMGA  ROA: -7	Conditi	ons and	Procedu 1904 5 4 13	res: P	ENP. W. S.D. R.D. + FOLL	I REA SCREE SCREE	11-811 1611
Prot	ace Finish, rusion, in. endicularity	AA /	'4'	Hole #1			ing Pin	
Flus Capa	ongitudinal h Gage Readi citance Gage Burr Height	ng, in. Readin	Transver	,	<u></u>	70%	ā <del></del>	×
				Readin lar Pos	gs (.000	)1 in.)	•	
	Axial Position	0°	45°	90°	180°	225°	270°	315°
	Bottom #1 #2 #3	-5.0 6.0 9.0 10.0	-8.0 5.0 7.0 8.0	11.0	-2.0 4.0 5.0 3.0	-4.6 7.0 8.0 8.0	-11.0 4.0 5.0	-8.0 2.0 8.0 8.0
	#5	10.0	11.0	9.0	8.0	7.0	5.0	8.0
Proti Perpe L Flush Capac	ace Finish, rusion, in. endicularity ongitudinal Gage Readi titance Gage Burr Height	77 , .001 , <u>0</u> ng, in. Reading	in./in. Transve	rse 1 <u>0</u>		Blui No	ng Pin I	Rollout
		4	Air Gage Angu	Reading	tion	1 In.):	, S	war.
							·	
!	Axial Position	0°	45°	90°	180°	225°	270°	315°
		0°	45°	90° -9.0	180° -5.0	225°	270°	315° -8,0

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 22 Specimen No. (34)	Qual C - 3E470	ity Vari	able Su	18-126 E -	Rough	-011-50 -17, pg. 5,	CPATCH			
Hole Manufacturing Conditions and Procedures: REAL LIFE LIFE LIFE LIFE LIFE LIFE LIFE LIF										
Hole #1  Surface Finish, AA //1-/20  Protrusion, in. 174  Perpendicularity, .001 in./in.  Longitudinal 10005 Transverse 1001  Flush Gage Reading, in. 1002  Capacitance Gage Reading 238  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position	Axial									
Bottom #1 #2 #3 #4	#2 60 60 5.0 6.0 7.0 5.0 5.0 #3 8.0 6.0 6.0 6.2 7.0 7.0 7.0 #4 7.0 6.0 4.0 4.0 7.0 6.0 7.0									
Surface Finish, AA 85-95  Protrusion, in. 176  Perpendicularity, .001 in./in.  Longitudinal 10015 Transverse 0  Flush Gage Reading, in.  Capacitance Gage Reading 225  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position	Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #1 #2 #3 #4	-3.0 90 10.0 11.0 13.0	-5.0 8.0 7.0 10.0 11.0	-7.0 2.0 8.0 11.0	-5.0 6.0 7.0 4.0	-3.0 8.0 9.0 8.0 10.0	5.0 7.0 7.0 9.0 11.0	-4.0 8.0 7.0 9.0 11.0			

Test Series 12 Quality Variable SUMPLE HOUGHWESS SCHARCH Specimen No. 3ELFC - 1E1FC PU. F.M. 125 M  Hole Manufacturing Conditions and Procedures: RFM: With Umark - SIZE MEMORY 1.755 MEMORY F. L. L. M. 502 Job. 12 Empired MSE Rent Procedures Procedures: RFM: With Umark - SIZE MEMORY 1.755 MEMORY F. L. L. M. 502 Job. 12 Empired MSE Rent Procedures P	MANUFACTURING REPORT: TAPERED HOLES											
Surface Finish, AA	Test Se Specime	eries <u>12</u> en No. <u>3F47</u>	Qual - 2 <i>E2</i> 7	ity Vari Ž	able Su	KEPSE MIO-I	- Rough	25 1811	CRATCH			
Surface Finish, AA	SIZE READER 1.755. READ ALL LINES PROPER PERMER USE BORIES TOOL SET OCT LIDE OF FOR SCRIFFEH Spindle, rpm 30 Feed: JT X I.B. CA											
Protrusion, in. /72 Perpendicularity, .001 in./in.  Longitudinal .021 Transverse .001 Flush Gage Reading, in002  Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 50 60 70 70 50 50 80 90  #2 7.0 5.0 40 5.0 80 90  #3 90 70 40 5.0 80 90  #5 100 10./in.  Longitudinal .005 Transverse .001  Surface Finish, AA Protrusion, in. 108 Perpendicularity, .001 in./in.  Longitudinal .005 Transverse .005  Flush Gage Reading in001  Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 5.0 5.0 80 7.0 -5.0 70.0 9.0  Bottom #1 5.0 5.0 80 7.0 -5.0 70.0 9.0  Bottom #1 5.0 5.0 80 7.0 -5.0 80 9.0  #3 2.0 7.0 5.0 7.0 8.0 9.0												
Angular Position    Axial   Position   0°   45°   90°   180°   225°   270°   315°	Protrusion, in. 172 Perpendicularity, .001 in./in. Longitudinal .001 Transverse .001 Flush Gage Reading, in002 706 Capacitance Gage Reading 225											
Axial   Position   0°   45°   90°   180°   225°   270°   315°												
#2 7.0 5.0 40 5.6 x 6 60 20  #3 9.0 7.0 6.0 20 6.0 9.0  #4 9.0 8.0 7.0 6.0 7.0 9.0 9.0  #5 10.0 10.0 9.0 7.0 7.0 9.0 9.0  Hole #2  Surface Finish, AA /00 Bluing Pin Rollout  Protrusion, in.  Longitudinal .005 Transverse .0015  Flush Gage Reading in001  Capacitance Gage Reading		Axial										
#3 9.0 7.0 6.0 2.0 7.0 9.0 9.0 9.0 9.0 #5 10.0 10.0 9.0 7.0 7.0 7.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9		Bottom #1	-5.0	-60	-2.0	70	-5.0	-8.0	-60			
H4   90   8.0   70   6.0   7.0   9			2.0		40			6.0	20			
H5   10.0   10.0   9.0   7.0   7.0   9.0			9.0		6.0	20			70			
Surface Finish, AA			10.0		9.0	3.0	3.0		90			
Angular Position  Axial Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 5.0 5.0 8.0 7.0 -5.0 70.0 -9.0 #2 6.0 5.0 7.0 6.0 8.0 8.0 9.0 #3 7.0 7.0 5.0 7.0 8.0 8.0 9.0	Proti Perpe l Flush Capac	Surface Finish, AA 100 Protrusion, in. 168 Perpendicularity, .001 in./in. Longitudinal .0005 Transverse .0015 Flush Gage Reading, in001 Capacitance Gage Reading 125										
Position 0° 45° 90° 180° 225° 270° 315°  Bottom #1 5.0 5.0 8.0 7.0 -5.0 70.0 -9.0  #2 6.0 5.0 3.0 6.0 8.0 9.0  #3 7.0 7.0 5.0 7.0 8.0 7.0 8.0												
#2 6.0 5.0 3.0 6.0 8.0 8.0 9.0 #3 7.0 7.0 5.0 7.0 8.0 7.0 8.0												
#3 20 70 5.0 7.0 8.0 8.0 90 #3 20 70 5.0 7.0 8.0 20 8.0		Bottom #1 -5.0 -5.0 -8.0 -7.0 -5.0 -10.0 -9.0										
		12 6.0 5.0 3.0 6.0 8.0 8.0 90										
			20	60	5.0				80			
15 9.0 9.0 7.0 5.0 7.0 6.0 7.0			9.0		7.0				1.0			

	M/	NUFACTU	RING REI	PORT: T	APERED	HOLES					
Test Se Specime	eries <u>12</u> en No. <u>3838</u>	Qual	ity Var	iable 52	IRFACE 17:10 I	-19045p	25/41	SCIARCH S			
Hole Ma	nufacturing	Conditi	ons and	Procedu	res: K	no L	With L	UNDER-			
Siz	EREPYOR	1.755	MEA	17 176.	D kitt	50%	171 181	M/1:1			
<u> </u>	dle, rpm	80	SET	005 P	eed:						
	ing Fluid:	DRY		Ď	epth: (	Ind. Rea	ding)	1.450			
					<del></del>	· · · · · · · · · · · · · · · · · · ·					
Surf	ace Finish.	AA 95		Hole #1		Blu	ina Pin	Rollout			
Surface Finish, AA 95-100 Protrusion, in. 177  Bluing Pin Rollout											
	Perpendicularity, .001 in./in.										
	Flush Gage Reading, in 001										
Capa	citance Gage	Reading		6	K	7-	}				
Exit	Burr Height	, in.						1			
Air Gage Readings (.0001 in.)											
Arr dage Readings (.000) in.) Angular Position											
	Axial	00	1.50	220	1000	2250	2700	-150			
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 -8.0 -8.0 -9.0 -6.0 -6.0 -7.0 -8.0										
	#2	5.0	6.0	6.0	2.0	2.0	7.0	5.0			
	#3	8.0	7.0	18.0	9.0	7.0	8.0	6.0			
	#5	100	8.0	11.0	11.0	110	90	10.0			
			1.11	1.11.7							
Cf.	ace Finish, A	10	ا می	Hole #2		R1	ng Pin	Rollout			
	rusion, in.	783	3	<del></del>		<u> </u>	ing i in	NOT TOUT			
Perpe	endicularity		n./in.	<del> </del>				7.5			
	ongitudinal		Transver	rse <u>101</u>	01	d		•			
	n Gage Readir citance Gage		102	·	- 7	1500		 			
•	Burr Height,	_	***					-			
		_				\	:				
		A	ir Gage	Reading ar Posi		<u>l in.)</u>		1			
,		<u></u>	Aligu	1 1031	T	T		<del>,</del>			
ļ	Axial	-0	0					2150			
	Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 -6.0 -60 -7.0 -5.0 -40 -9.0 -9.0										
Ì	#2	6.0	5.0	5.0	5.0	6.0	5.0	5.0			
	#3 #4	80	8.0	7.0	7.0	8.0	6.0	7.2			
	#4	1/0	110	110	9.0	160	7.0	20			

MANUFACTURING REPORT: TAPERED HOLES											
Test Se Specime	eries <u>22</u> en No. <u>28186</u>	Qual - 683	ity Vari ${\cal B}$	able 5 <u>u</u>	REACE M	RUNTA JAT.	125/	<u>SCRRTC</u> h			
<u> </u>	Hole Manufacturing Conditions and Procedures: READ WITH UNDER- SIZE READER! 1.755 READ 1930 L.H. SD, UNI 18 SD										
Prot Perp L Flus Capa	Surface Finish, AA 100  Protrusion, in. 188  Perpendicularity, .001 in./in.  Longitudinal 1001 Transverse 1001  Flush Gage Reading, in001  Capacitance Gage Reading 213  Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2 #3 #4 #5	-5.0 8.0 9.0 9.0 13.0	-9.0 5.0 2.0 8.0 10.0	-6.0 4.0 7.0 7.0 10.0	-5.0 5.0 7.0 7.0 10.0	-40 60 80 7.0 12.0	-7.0 5.0 8.0 8.0 9.0	-7.0 2 c 8.0 9.0 11.0			
Proti Perpe I Flust Capac	Surface Finish, AA 100  Protrusion, in. 184  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse .0025  Flush Gage Reading, in. Capacitance Gage Reading 239  Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position  Axial											
	Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	50 20 20 80	8.0 4.0 6.0 7.0	-8.0 5.0 6.0 12.0	7.0 2.0 8.0 9.0	-40 8.0 9.0 9.0 10.0	-9.0 2.0 8.0 9.0	-9.0 6.0 7.0 8.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries 22 en No. 61/6/	Qual -6645	ity Vari	able Su	Maria . E.	13 1 - 12 M	P.po.			
Hole Manufacturing Conditions and Procedures: Park 10 10 10 10 10 10 10 10 10 10 10 10 10										
Hole #1 Surface Finish, AA / O Bluing Pin Rollout Protrusion, In. / **										
L Flus Capa	Protrusion, in. //- Perpendicularity, .001 in./in. Longitudinal .002 Transverse .005 Flush Gage Reading, in. Capacitance Gage Reading 237 Exit Burr Height, in.									
Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	-8.0	-100	10.0	10.0	-8.0	-11.0	-110		
	#3	5.0	40	4.0	4.0	3.0	3.0	4.0		
	#5	6.0	7.0	6.0	6.0	7.0	6.0	5.0		
Proti Perpe l Flush Capac	Surface Finish, AA //O Bluing Pin Rollout Protrusion, in. //4 Perpendicularity, .001 in./in. Longitudinal O Transverse O Flush Gage Reading, in002 Capacitance Gage Reading 1/2 Exit Burr Height, in.									
Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2	<u>-9.0</u>	-11.0	-//.0	-9.0 3.0	-8.0	-11.0 3.0	-100		
	#3	3.0	5,0	4.0	4.0	40	3.0	5:0		
	#4	7.0	7.0	60	7.0	7.0	5.0	6.0		

MANUFACTURING REPORT: TAPERED HOLES											
							<del></del>				
Specine	n No. 3/34/3/	<u>4</u> #16	ity Vari	able 5/	IBERLE TIU. TA	-Rody B	R'ALS	<u> </u>			
REFE	nufacturing	14EALA	10:0	6. H. SI	1:001	PKAA	AE 18	16			
Spindle, rpm 8: Feed: 5 8 In. 14											
Cutting Fluid: 111. Depth: (Ind. Reading) 2,440											
Hole #1											
Surface Finish, AA //O Bluing Pin Rollout Protrusion, in. /66											
Perp	endicularity	, 001	n./in.	0	<del></del> -	_		-			
	ongitudinal / h Gage Readi				— ,	15%	2				
	citance Gage		24	3	_	1 ~					
LAIL	Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position											
	Axial										
	Position		45°	90°		225°	270°	315°			
	Bottom #1 #2	-13.0 <b>2.</b> 0	-13.0	-9.0 20	2.0	-4.0	2.0	-9.0 2.0			
	#3	3.0	3.0	2.0	3.0	2.0	3.0	3.0			
	#4	3.0	10	4.0	3.0	5.0	3.0	3.0			
			· · · · · · · · · · · · · · · · · · ·								
	ace Finish, A		, 3	Hole #2		Blui	ng Pin	Rollout			
	rusion, in. endicularity,		n /in			-		.4			
t	ongitudinal,	0025	Transve		<u>_</u>	,					
	n Gage Readin citance Gage		254	<u> </u>	_	80%		`			
	Burr Height,		<del></del>			U					
		A	ir Gage			1 in.)		Š			
Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 -5.0 -7.0 -7.0 -8.0 -6.0 -5.0 -5.0										
	#2	2,7	2.0	1.0	1.0	2.0	3.0	3.0			
	#4_	30	20	1.0	4.0	4.0 4.0 8.0	40	5.0			
	#5	10.0	90	80	9.0	8.0	9.0	9.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 2 Specimen No. 605	2 Qual 7168186	ity Vari	able 54	MERCE	-12 125 1	· · · · · · · · · · · · · · · · · · ·	CARTCH			
Hole Manufacturing Conditions and Procedures: Who was properly STE  READSTRIPS REHITLAND L.M. SP. PAI REPARTE  UCL READSTRIPS REHITLAND L.M. SP. PAI REPARTE  Spindle, rpm 80 Feed: YELL  Cutting Fluid: DRY Depth: (Ind. Reading) 1990										
Surface Finish, AA 90 Bluing Pin Rollout Protrusion, in. 174 Perpendicularity, .001 in./in. Longitudinal 1001 Transverse 0 Flush Gage Reading, in 601 Capacitance Gage Reading 243 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
Axial Position										
Bottom			-14.0	130	-14.0	-14.0	-14.0			
	12 <b>3</b> <i>a</i> 3 <i>a</i> 3 <i>a</i> 5 <i>a</i> 6	3.0	3.0 5.0	J. Q 4. Q	5.0	3.0	3.0			
	14 5.0	5.0	4.0	40	40	5.0	50			
Protrusion, ir Perpendiculari Longitudir Flush Gage Rea Capacitance Ga	Surface Finish, AA 100-35 Bluing Pin Rollout Protrusion, in. 166 Perpendicularity, .001 in./in. Longitudinal 10005 Transverse 1001 Flush Gage Reading, in. Q Capacitance Gage Reading 218 Exit Burr Height, in.									
	Air Gage Readings (.0001 in.) Angular Position									
Axial Position	Axial Position 0° 45° 90° 180° 225° 270° 315°									
Bottom #		-14.0	-/20	-14.0	-14.0	-12.0	-14.0			
#	#2 3.0 3.0 3.0 4.0 3.0 3.0 3.0 #3 6.0 5.0 4.0 5.0 5.0 5.0									
		50	3.0	5.0	5.0	5.0	6.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	Test Series 22 Quality Variable SUNFACE - HOUGHNESS - SCHUTCH Specimen No. 603R 44195BC A910 Fet. 125RA95									
Hole Manufacturing Conditions and Procedures: PERM UNDER-S, ZE    READER 1.755 REDN MOD. L.H. SP. RAI READER  USC BAA. ~7 for SEt COS LAUI ME FOR STIFFERS  Spindle, rpm & Feed: SF F. R.J.  Cutting Fluid: DRY Depth: (Ind. Reading) 2,440										
Surface Finish, AA 100  Protrusion, in. 171  Perpendicularity, .001 in./in.  Longitudinal 0 Transverse 1002  Flush Gage Reading, in.  Capacitance Gage Reading 248  Exit Burr Height, in.										
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2 #3 #4 #5	-14.0 2.0 5.0 4.0 5.0	1.0 1.0 4.0 3.0 4.0	-14.0 2.0 4.0 3.0 4.0	-13.0 3.0 4.0 4.0 5.0	-13.0 4.0 5.0 4.0	-13.0 3.0 4.0 4.0 4.0	-14.0 3.0 5.0 5.0 5.0		
Protr Perpe l Flush Capac	ace Finish, A rusion, in. endicularity, Longitudinal n Gage Readin citance Gage Burr Height,	.001 in g, in. Reading	n./in. Transver		= - 2 8	Blui	ng Pin I	Rollout		
		<u>A</u>	r Gage Angul	Reading ar Posi	s ( <u>0001</u> tign	<u>in.)</u>		<b>&gt; ~</b>		
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 -//.0 -/2.0 -/2.0 -/2.0 -//.0 -/2.0 -/									

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	ries <u>21</u> n No. <u>1818</u> (.	Qual	ity Vari	able 54	MARKET A	125	N . 3	-// -/-		
MS. Spin	Hole Manufacturing Conditions and Procedures: (FRA) (F									
Prot Perp L Flus Capa	Surface Finish, AA //5 Bluing Pin Rollout Protrusion, in. /80 Perpendicularity, .001 in./in. Longitudinal Transverse O Flush Gage Reading, in. Capacitance Gage Reading 242 Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-10.0	-10.0	-11.0	-11.0	-160	-110	- 11.0		
	#2	3.0	3.0	4.0	5.0	3.0	30	30		
	#4	5.0	40	3.3	40	5.0	4.0	37. [		
	#5	6.0	8.0	8.0	8.0	9.0	7.0	6.0		
Proti Perpe L Flush Capac	Surface Finish, AA 105  Protrusion, in.  Perpendicularity, .001 in./in.  Longitudinal 1011 Transverse  Flush Gage Reading, in.  Capacitance Gage Reading  Exit Burr Height, in.									
•	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 -13.0 -13.0 -13.0 -14.0 -13.0 -14.0 -13.0									
	#2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0									
	#3	5,0	4.0	3.0	3.0	3.0	4.0	3.8		
	#5	6.0	5.0	3.0	50	6.	4.0	5.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>12</u> en No. 49/14	Qual 667C	ity Vari			Rouge		QUALITY		
Hole Manufacturing Conditions and Procedures: REAM UNIEN. 5, ZE  REMAIN. 1.755 REAM MILLIHISTO, AND BEFORER USE  STR. 947 Flute REMAIN Plum of 1.700 ± 100 h im themswerest Pos  Spindle, rpm  Cutting Fluid: DAY  Depth: (Ind. Reading) 2 440										
Hole #1 Surface Finish, AA										
Protrusion, in. 178										
Perpendicularity, .001 in./in. Longitudinal Transverse , 002										
Flush Gage Reading, in002 Capacitance Gage Reading 251										
Exit Burr Height, in.										
319	Air Gage Readings (.0001 in.) Angular Position									
319	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-90	-7.0	-8.C	-10	-8.0	-9.0	- 9.0		
	#2	8.0	13.0	13.0	4.0	14.0	12.0	5.0		
	#4	100	15.0	15.0	5.6	140	13.5	10.0		
	#5	11.0	12.0	130	166		11.0	12.0		
Surface Finish, AA 100 Protrusion, in. 158 Perpendicularity, .001 in./in. Longitudinal, 0005 Transverse .002 Flush Gage Reading, in. 7.001 Capacitance Gage Reading 251 Exit Burr Height, in.										
2192		<u>A</u>		Reading lar Posi		1 in.)				
324	Axial Position	0°	45°	90°	180°	225°	270°	315°		
		-90	112	11.0	-10.0	-9.0	-8.0	-8.0		
	12 6.0 6.0 80 5.0 7.0 10.0 7.0									
	#3	910	13.0	14.0	4.0	11.0	13.0	13.0		
	#5	10.0	10.0	10.0	80	12.0	12.0	13.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>22</u> en No. <u>48186</u>	Qual - <u>1C4</u> †C	ity Vari	able 54	IRFACE 110 In	-ROJEH 1. 125	MT55 0 R115.	VALLY		
Hole Manufacturing Conditions and Procedures: REAM UNDER SIZE  REAMER 1.755 REPARTED PROBLET TOO TOOL IN THRESTREE POS  Spindle, rpm 80 Feed: 58.1.0.00.  Cutting Fluid: DAY Depth: (Ind. Reading) 2.440										
Hole #1  Surface Finish, AA /0: /6 Bluing Pin Rollout  Protrusion, in. /60  Perpendicularity, .001 in./in.  Longitudinal 10015 Transverse 0										
Capa	Flush Gage Reading, in. Capacitance Gage Reading Exit Burr Height, in.  Air Case Reading ( 0001 in )									
218-	Air Gage Readings (.0001 in.) Angular Position									
318	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-110	-10.0	-/4.0	-10.0	-80	90	-10.0		
	#2	6.0	10.0	11.0	5.0 3.0	11.0	7. C	9.0		
	#4	8:5	13.0	13.0	1.0	1.0	140	11.0		
	#5	100	12.0	12.0	90	13.0	10.0	10.0		
Proti Perpo I Flusi Capac	Hole #2  Surface Finish, AA /OC /CS  Protrusion, in. /64  Perpendicularity, .001 in./in.  Longitudinal .0065 Transverse .002  Flush Gage Reading, in. 7001  Capacitance Gage Reading 260  Exit Burr Height, in.									
317/		A		Reading: ar Posi		lin.)		)::		
3:4	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	9.0	9.0	-10.0 9.0	-8.0 7.0	-8.0 9.0	-8.0 9.0	8.0		
	#3	8.5	12.0	12.0	7.0	120	12.0	20		
	#4	150	140	140	7.0	13.0	14.0	11.0		
	#5	1.2	10.0	13.0	11.0	12.0	12.0	10.0		

MANUFACTURING REPORT: TAPERED HOLES									
Test Se Specime	Test Series 22 Quality Variable Suprace-Roughness- Ovality Specimen No. 4#286-3547 Mio. 5-1. 125 RAS								
Hole Manufacturing Conditions and Procedures: / EAM UNDER SIZE  196 NOTE 1.755 REMA MOU L.H. SOTIAL REPORTS USE  STRICT FILES REPORTER DILL OF 1200 COME IN ACCOUNTS POS									
Spindle, rpm 90 Feed: JEP. A. Cutting Fluid: DRY Depth: (Ind. Reading) 2.440									
Surface Finish, AA 100 1100 Bluing Pin Rollout									
Protrusion, in. /74 Perpendicularity, .001'in./in.									
Longitudinal, 1005 Transverse O  Flush Gage Reading, in, 001  Capacitance Gage Reading 159  Exit Burr Height, in.									
Air Gage Readings (.0001 in.) Angular Position									
318	Axial Position	00	45°	90°	180°	225°	270°	315°	
•	Bottom #1	6.0	-100	-8.0	-6.0	-5.0	5.0	-5.0	
	#3 #4	9.0	13.0	13.0	7.0	12.0	13.0	10.3	
		13.0	11.0	130	10,0	13.0	11.0	1/7 2	
	ace Finish, A	A 10		iole #2		Blui	ng Pin I	Rollout	
Perp	rusion, in. endicularity, Longitudinal			· s	<del></del>			· ·	
Flusi Capac	h Gage Readin citance Gage Burr Height,	g, in. Reading				55%	Ĺ		
3/2/		<u>.A</u>	ir Gage Angul	Reading ar Posi	s (.000 tion	<u>1 in.)</u>		.i. 3	
324	Axial Position	0°	45°	90°	180°	225°	270°	315°	
	Bottom #1	10.0	-9.0	-11.0	-11.0	-8.0	-8.0 7.0	-10.0	
	#3 #4	7.0	11.0	12.0 13.0	50	11.0	13.0	5.0	
	#5	11.0	11.0	12.0	11.0	10.0	10.0	10.0	

MANUFACTURING REPORT: TAPERED HOLES										
Test So Specime	eries <u>22</u> en No. <u>2/353</u>	Qual 6650	ity Vari と	able Su	MSPEL.	ROUZAN T. 1251	ESS - 01	RITY		
Hole Manufacturing Conditions and Procedures: REPIN UNDER SIZE  MINISTER 1753 PERSON AND LIFE SPINISH REPORTER USE STUDENT  FILTE REPORT IN 121/14/5/5 1710 - 004 IN TRANSPORTER DOS										
Spindle, rpm 80 Feed: 5- 8. F. P. P. P. Cutting Fluid: 1164 Depth: (Ind. Reading) 2.440										
Surface Finish, AA /00 Hole #1  Bluing Pin Rollout										
Protrusion, in. 183- Perpendicularity, .001 in./in.										
Flush Gage Reading, in. 201 Capacitance Gage Reading 267 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
324	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-9.0	-9.0	-80	-6.0	.70	-6.0	-8.0		
	#2	7.0	120	12.0	4.0	11.0	13.0	12.0		
	#4	10.0	14 C	14.0	40	13.0	13.0	13.0		
	#5	13.0	11.0	13.0	100	13.0	12.0	13.0		
Prot Perp	ace Finish, A rusion, in. endicularity, Longitudinal	.001 ii	n./in.	fole #2		Blui	ng Pin f	Rollout		
Capa	h Gage Readin citance Gage Burr Height,	Reading	245		_ 65°	C				
317	·	<u>A</u> :		Reading: ar Posi		<u>in.)</u>				
- 3 - 1	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2 #3	8.0	-70 73	10.0	-8.0 <b>8</b> .0 6.2	-7.0 70 12.0	-8.0 4.0 13.0	-7.0 2.2		
			19.0	142	50	13.0	14.0	13.0		

	MA	NUFACTU	RING REF	PORT: T	APERED	HOLES				
Test Se Specime	Test Series 12 Quality Variable SURFACE - PC 191 WESS - OVALITY Specimen No. 4C6BC-6B17C ATIO. INT 125 17A75									
Hole Manufacturing Conditions and Procedures: REAM UNDER SIZE  REAM, IL 1755 REMAI MOD. L. H. SMINH REAMER USE STRIGHT  FIVE REMAIN DIVERE 1.700 SIGE IN TRANSPORT DOS.  Spindle, rpm 20 Feed: F. F. F. M.  Cutting Fluid: DRY Depth: (Ind. Reading) 2.440										
Hole #1 Surface Finish, AA #/O Bluing Pin Rollout Protrusion, in. /80										
Perpendicularity, .001 in./in.  Longitudinal 1001 Transverse 1001  Flush Gage Reading, in. 1003  Capacitance Gage Reading 25%  Exit Burr Height, in.										
Air Gage Readings (.0001 in.)										
318	Axial Position	0°	Angu 45°	lar Posi	tion 180°	225°	270°	315°		
	Bottom #1 #2 #3	-8.0 6.0 8.0	·5:0	-2.0 6.0 12.0	-5.0 5.0 5.6	-5.0 7.0 11.0	-6.0 9.0	-7.0 8.0		
	#4	13.0	14.0	13.0	5.0	13. c 13. c	12.0	13.0		
	ace Finish, A	A //	0	Hole #2	_	BIĜi	ng Pin I	Rollout		
Perpe l Flust Capac	rusion, in endicularity, Longitudinal, h Gage Readin citance Gage Burr Height,	g, in. Reading	Transver	rse , <u>oo</u>	_ \s' \s'	sob		· .		
312				Reading ar Posi		<u>1 in.)</u>				
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	50	6.0	-7.0 8.0	-8.0 4.0	-50	11.3	1.0		
	#3 #4 #5	90 11.0	13.0	14.5	5.0	11.0 14.0 15.0	150	130		

MANUFACTURING REPORT: TAPERED HOLES										
Test S Specim	eries 12 en No. <u>6248</u>	Qual 12385 t	ity Vari	lable 5/	ARio SA	t. 125	Juisse :	CHILLY		
Hole Manufacturing Conditions and Procedures: REACT WAREN-SIZE  REACT 1.755. REACT 1900. L.H. SPICE 1800. L. M. SPICE 18										
Surface Finish, AA /60 Protrusion, in. /60 Perpendicularity, .001 in./in. Longitudinal 1001 Transverse .005 Flush Gage Reading, in1001 Capacitance Gage Reading 254 Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
311	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-15.0	-/2.5	140	-140	_	15.0			
	#2	3.0	30	4.0	4.0	4.0	5.0	3.0		
	#4	3.0	8.0	10.0	5.0	8.0	8.5	6.6		
	#5	6.C	8.0	7.0	100	8.0	7.3	75		
Proti Perpo I Flusi Capac	Surface Finish, AA //6 Protrusion, in. /3 Perpendicularity, .001 in./in. Longitudinal /63/ Transverse O Flush Gage Reading, in. Capacitance Gage Reading 258 Exit Burr Height, in.									
318		<u>A</u>		Reading: ar Posi	s (.0001 tion	in.)	<del></del>			
5 -	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1	-14.0	-13.0	-15:0	-14.0	14.0	-1:0	-14.0		
	#2	40	2.0	2.0	2.0	3.0	4.0	4.0		
	#3	5.0	20	70	4.0	5.0	8.0	20		
	#5	63	7.0	8.0	6.0	7.0	8.0	8.0		

Test Series 12 Quality Variable SURFACE ROUTH NESS- Specimen No. 60536 L 2067C NID. Int 125 R145  Hole Manufacturing Conditions and Procedures: REAM UNDITED IN 1850. SEAM MODERN SERVICE DISTANCE DISTANCE DISTANCE DISTANCE DISTANCE DEPTH: (Ind. Reading) Cutting Fluid: DITED Depth: (Ind. Reading)	SiZE									
Studie, rpm 8) Feed: John Plans Cutting Fluid: 1000 plans for Depth: (Ind. Reading)	1SE									
Spindle, rpm 85 Feed: 10 Feed:	1140									
Hole #1 Surface Finish, AA <u>//O</u> Bluing Pin Rollout										
Protrusion, in. 165 Perpendicularity, .001 in./in. Longitudinal O Transverse .0025										
Flush Gage Reading, in GOI 15 10 Capacitance Gage Reading 254										
Exit Burr Height, In.  Air Gage Readings (.0001 in.)										
Angular Position	•									
Axial Position 0° 45° 90° 180° 225° 270°	315°									
Bottom #1 -14.0 -12.0 -14.0 -14.0 -13.0 -12.0	-15.0									
#2 3.0 4.0 4.0 2.0 1.0 4.0	3.0									
#3 5.0 2.0 2.0 3.0 6.0 2.0	4.0									
#4 5.0 8.0 8.0 4.0 8.0 7.0 #5 5.0 8.0 8.0 5.0 7.0 7.0	120									
#313:0 10:0 1a:0 3:0 7:0 7:0	17.0									
Hole #2 Surface Finish, AA 90 Bluing Pin	Rollout									
Protrusion, in. 160	• . • . "									
Perpendicularity, .001 in./in. Longitudinal .000. Transverse .00/	-									
Flush Gage Reading, in. \( \cdot \) OO \( \cdot \) Capacitance Gage Reading \( \frac{160}{2} \)										
Exit Burr Height, in.	47.5									
Air Gage Readings (.0001 in.) Angular Position	e a									
Arigular Post Cion										
Axial Position 0° 45° 90° 180° 225° 270°	315°									
Bottom #1 -140 -13.0 -13.0 -15.0 -15.0 -15.0 -15.0	-15.0									
#2 3.7 4.0 4.6 2.0 1.0 5.0	3.0									
#3 42 70 70 50 60 80	5.0									
#5 60 × 2 8.0 5.0 7.0 8.2	20									

MANUFACTURING REPORT: TAPERED HOLES												
Test Se Specime	Test Series 22 Quality Variable SURFACE ROUYOFF - OVALITY Specimen No. 3RIBCL 4E3BC MIO. INT. 125RITS											
Hole Manufacturing Conditions and Procedures: REAR UNDER - ZE  REAR 1.755 REAR MORE PROPER PROPERTY USE  SPINGE FROM SO FEED: 100 to 10												
Hole #1												
Surface Finish, AA 100 Bluing Pin Rollout												
Protrusion, in. 172 Perpendicularity, .001 in./in.  Longitudinal 0 Transverse 10015 Flush Gage Reading, in002 Capacitance Gage Reading 248 Exit Burr Height, in.												
Air Gage Readings (.0001 in.) Angular Position												
318	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1											
	#2	5.0	7.0	4.0	3.0	2.0	2 7	4.0				
	#4	6.0	8.0	8.6	4.0	4.	8.0	2.0				
П	#5	6.0	8.3	6.0	5.0	8.0	9.0	8.0				
Proti Perpe L Flush Capac	Surface Finish, AA /00 Bluing Pin Rollout Protrusion, in. /7/ Perpendicularity, .001 in./in. Longitudinal .001 Transverse 0 Flush Gage Reading, in. Capacitance Gage Reading 238 Exit Burr Height, in.											
317	r	<u>A</u>	ir Gage Angul	Reading ar Posi	s (.0001 tion	jn.)	- <u>4</u>	(F*)				
157	Axial Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-140	-140	15:0	14.0			-13.0				
	#2	3.0	5.0	5.0	4.0	6.0	5,0	4.0				
	#4	5.0	9.0	10.0	6.0	20	9.0	8.5				
	#5	7.0	90	7.0	60	7.0	8.0	8.0				

MANUFACTURING REPORT: TAPERED HOLES											
Test Series 12 Quality Variable SURFACE. ROUGH WEST ONALL OF Specimen No. 466864 16286 Aliv. Ent. 125 RIPS											
Hole Manufacturing Conditions and Procedures: REAR UNCLASSE  REAR LAND REMARKS PLANTED TO PARTY MARKET NO.  Spindle, rpm 80 Feed: SEPAC  Cutting Fluid: DRY Depth: (Ind. Reading) 2 445											
Surface Finish, AA 105 Hole #1  Bluing Pin Rollout											
Prot	rusion, in.	162				Biul	ng rin	KOT TOUT			
Flus Capa	Perpendicularity, .001 in./in.  Longitudinal 0 Transverse 0  Flush Gage Reading, in002  Capacitance Gage Reading 255										
EXIT	Burr Height							$\mathbf{z}^{\mathrm{L}}$			
317	Air Gage Readings (.0001 in.)  Angular Position										
323	Axial Position	0°	45°	90°	180°	225°	270°	315°			
!	Bottom #1										
	#2	3.0	7.0	4.0 8.0	4.0	3.0	7.0	7.0			
	#4	60	8.0	9.0	5.0	2.0	8.0	7.0			
	#5	6.0	90	8.0	6.0	70	8.0	7.0			
	ace Finish, A			lole #2	_	Blui	ng Pin I	Rollout			
Perpe L Flush Capac	endicularity, ongitudinal o Gage Readin citance Gage Burr Height,	.001 i .00/ g, in. Reading	Transver <i>O</i>	'se ' <i>60</i> 2		oh		Rindman			
718		<u>A</u>		Reading: ar Posi	s (.0001 tion	<u>in.)</u> ,	11	~			
324	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1	14.0	-140		150	-13.0	-13.0	-13.0			
	#2	3.0	4.0	4.0	3.0	20	510	4.0			
}	#3	6.0	7.0	7.0	5.0	8.0	9.0	7.0			
	#5	5.0	8.0	9.0	6.0	7.0	7.0	8.0			

	M/	ANUFACTU	RING REF	PORT: T	APERED H	IOLES					
Test Se Specime	eries <u>12</u> en No. <u>484 8</u>	Qual	ity Vari 8と	able S	UNFHCE 1. O. Im	Rough	-688-0 12MS.	VHILLY			
\$\$ 47 \$\$71 \$p\$r	Hole Manufacturing Conditions and Procedures: / REAM UNITE SIZE  REAMER 1.755. FINE NO. 1. L.H. SP.RM REPAIR MSE  Statement Flate Ream a Milio 1700 E. 306 in this mestical position of the Sp. M. P. P. Spindle, rpm  Cutting Fluid: DRY  Depth: (Ind. Reading) 2.440										
Surface Finish, AA 90  Protrusion, in. 160  Perpendicularity, .001 in./in.  Longitudinal 1005 Transverse 0  Flush Gage Reading, in001  Capacitance Gage Reading 229  Exit Burr Height, in.											
		4	Air Gage Angu	Reading lar Posi		<u>1 in.)</u>		The ran			
318	Axial Position	0°	45°	90°	180°	225°	270°	315° ·			
324	#2 #3 #4 #5	7.0	-7.0 4.0 9.0 11.0 12.0	5.0 8.0 11.0 12.0 12.0	-2.0 3.0 2.0 6.0 12.0	5.0 -2.0 5.0 9.0 11.0	-7.0 1.0 8.0 10.0 13.0	-6.0 -2.0 10.0 11.0			
Proti Perpo I Flusi Capac	ace Finish, A rusion, in. endicularity Longitudinal h Gage Readin citance Gage Burr Height	/2, .001 i .001 ng, in. Reading	70 y n./in. Transver	iole #2	<u> </u>	Bluii	ng Pin F	ollout			
3/8		<u>A</u>	ir Gage Angul	Reading: ar Posit		<u>in.)</u>		*			
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3 #4 #5	50 0 23 100	-7.0 1.0 5.0 9.0 11.0	9.0 20 10.0 11.0	73.0 3.0 4.0 5.0 3.0	13.0 4.0 8.0 8.0 9.0	-13.0 5.0 8.0 9.0 8.0	-14.0 3.0 6.3 2.3 2.3			

## INSPECTION SHEETS FOR TEST SERIES 23 COMBINED VARIABLES

Test Se	ries 23	NUFACTUI	ity Vari		APERED I		lsrm.	MIDIN
Hole Ma	n No. 3A2TC nufacturing 5REAM MOD	Condition	ons and	Procedu	res: RI	-		
Spin Cutt	dle, rpm <u>80</u> ing Fluid:	DRY			eed: 59 epth: (	B 1PM Ind. Read	ding) [	.440
Surf	ace Finish, a	AA <u>95-</u>	100	Hole #1		Blu	ing Pin	Rollou
Perpe Lo Flusi	endicularity ongitudinal h Gage Readi	, .001 i . <b>0005</b> T	n./in. ransver .000	0			• •	
Capa	citance Gage Burr Height	Reading , in	302				Radian A	
-1	<u> </u>	<u>A</u>	ir Gage Angu	Reading lar Pos	s (.000 ition	1 in.)	T	·
	Axial Position	0°	45°	90°	180°	225°	270°	315°
	#2_	-10.0	-13.0 1.0	-14.0	13.0	-12.0	-11.0	-12.0
	#3 #4 #5	2.0 2.0 3.0	2.0 2.0 4.0	2.0	3.0 3.0 4.0	3.0 3.0 5.0	3.0 3.0 4.0	2.0 1.0 5.0
Surfa	ice Finish, A	A lon		iole #2	<del></del>	Blui	ng Pin	Rollout
Protr Perpe L Flush Capac	rusion, inendicularity, ongitudinal Gage Readin itance Gage Burr Height,	.171 .001 in .0005 ig, in. Reading	n./in. Transvei	se 00	_			
		<u>A</u>	ir Gage Angul	Reading ar Posi		1 in.)		
	Axial Position	0°	45°	90°	180°	225°	270°	315°
	Bottom #1 #2 #3	-12.0 1.0 3.0	0.41- 0.1 0.2	-12.0 1.0 2.0	-12.0 1.0 2.0	-13.0 1.0 2.0	- 15.0 0 2.0	-14.0 1.0 2.0
	#4	2.0	2.0	2.0	1.0	0	1.0 3.0	2.0

	M	ANUFACTU	RING REF	PORT: T	APERED	HOLES						
Test Se Specime	eries <u>23</u> en No. 2BGT		ity Vari TC	able 2	URFACE	RGH.,12	5 RMD.	JUL OIM				
	anufacturing 5 REAM MOD				res: B	EAM UN	DERSIZE	D REAME				
Spir Cut	Spindle, rpm <u>80</u> Feed: <u>55 % IPM</u> Cutting Fluid: <u>DRY</u> Depth: (Ind. Reading) <u>2.440</u>											
				Hole #1								
Surface Finish, AA 100-125 Bluing Pin Rollout												
	rusion, in.						het.					
	endicularity ongitudinal.			se 000	\ <b>E</b>		5					
	sh Gage Readi			30 <u>.VUL</u>	10_		1	12				
Capa	icitance Gage	Reading	2.98			č	- IE	123				
Exit	: Burr Height	, in						Trees.				
			le Gage	Pendin	ne ( 000	11 in 1						
	Air Gage Readings (.0001 in.) Angular Position											
	Axial	T			I	1	T					
	Position	0°	45°	90°	180°	225°	270°	315°				
	Bottom #1	-14.0	-12.0	-12.0	-9.0	-9.0	-10.0	-13.0				
	#2	-14.0	0	2.0	1.0	1.0	0.5	1.0				
	#3	0.5	2.0	2.0	1.0	2.0	3.0	3.0				
	#4	0.5	0.5	0.	2.0	2.0	2.0	3.0				
	#5	3.0	5.0	14.0	5.0	5.0	5.0	5.0				
	······································			iole #2								
Surf	ace Finish, A	AA d	95-100	1016 #2		Blui	ng Pin	Rollout				
	rusion, in.		20_100_									
Perp	endicularity,	, .001 i					- ' ,}					
_,	Longitudinal	·0010	Transver	se ,00	105		<b>56</b> 14	: 1.0				
	h Gage Readir citance Gage		-,00 <del>2</del>		<del></del>			\$ 34 14 miles				
	Burr Height,		339				• 15	1 12				
-,,,	,	_					- P					
		<u>A</u>	ir Gage	Reading	s (.000°	<u> in.)</u>						
			Angu i	ar Posi	tion							
	Axial											
	Position	0°	45°	90°	180°	225°	270°	315°				
	Potter #1	-150	-14.0	-14.0	-13.0	-12.0	-14.0	-15.0				
	Bottom #1 #2	-15.0 2.0	-14.0 2.0		2.0	-13.0 2.0	-14.0 2.0	-15.0 2.0				
	#3	2.0	3.0	3.0 2.0	2.0		2.0	2.0				
	#4	1.0	2.0	0	0	0.5	0	1.0				
	#5	0.5	0.5	2.0	0	0	1.0	0.5				

MA	NUFACTU	RING REF	ORT: T	APERED H	IOLES	<del></del>					
Test Series 23 Specimen No. 3DITC	Test Series 23 Quality Variable Surf. RGH 125 RMS MID. INT. Specimen No. 3DITC 438CTC										
Hole Manufacturing ( <u>1.755 REAM MOC</u>	Condition	ons and	Procedu REAMES	res: R	EAM UN	OLPSIZ	E REAME				
Spindle, rpm <b>1</b> Cutting Fluid:	DRY			eed: 🔁 epth: (I	S & L.P. nd. Read		.440				
Hole #1 Surface Finish, AA 95-100  Protrusion in 177											
Protrusion, in. 177 Perpendicularity, .001 in./in. Longitudinal .0015 Transverse .0005 Flush Gage Reading, in003 Capacitance Gage Reading 294 Exit Burr Height, in.											
	Air Gage Readings (.0001 in.) Angular Position										
Axial Position	0°	45°	90°	180°	225°	270°	315°				
#2	-10.0 2.0 3.0	-11.0 2.0 3.0	-13.0 1.0 3.0	- I4.0 I.0	2.0	-9.0 2.0 2.0	-10.0 2.0				
#4	3.0 4.0	3.0 5.0	3.0 5.0	4.0	4.0	3.0	4.0				
Surface Finish, A Protrusion, in. Perpendicularity, Longitudinal	.001 i	-125		 100	Blui	ng Pin F	Rollout				
Capacitance Gage	Flush Gage Reading, in. +.002 Capacitance Gage Reading Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
Axial		Angul	ar Posi	tion							
Position	0°	45°	90°	180°	225°	270°	315°				
#2	13.0	0	-14.0 0	-10.0	-12.0 Q	-12.0 0	0 0				
#3 #4 #5	1.0 1.0	1.9 0	-7'0 O	-1.0	-1.0 0	-LO -LO	-1.0				

			<del></del>								
	MANUFACTU	IRING REF	PORT: T	APERED	HOLES						
Test Series 23 Quality Variable SURFACE ROYGHUESS 126 RMS Specimen No. 3ESTE4838C MID INTERPRESE											
Hole Manufacturing Conditions and Procedures: REAM UNDERSIZE REAMER											
Spindle, rpm	0		F	eed:	TIPM.						
Cutting Fluid:	DRY		0	epth: (	Ind. Rea	ding) g	440				
Hole #1 Surface Finish, AA 95-105 Protrusion, in. 176 Bluing Pin Rollout											
Perpendiculari	ty, .001	in./in.	000			in a	in to record				
Longitudina Flush Gage Rea	ding. in.	ransver	ise Tixiki	5_			年. 漢				
Capacitance Ga	ge Readin	9 30					2 1 1 1 1 1 1				
Exit Burr Heig	ht, in.					•					
		Air Gage	Reading	gs (.000	)1 in.)	• : • · ·					
			lar Pos		<del></del>	<del></del>	•				
Axial Position	00	45°	90°	180°	225°	270°	315°				
		+	-	+		+	+				
Bottom #		-NO	-15.0	+ M.O		-15.0	-14.0				
		2.0	1.0	1.0	2.0	2.0	2.0				
The state of the s		2.0	0	0	2.0	2.0	2.0				
	3.0	3.0	0.5	3.0	3.0	1.0	3.0				
Surface Finish Protrusion, in Perpendiculari	165 y, .001	-100 in./in.	Hole #2		Blui	ing Pin	Rollout				
Longitudina Flush Gage Read	0005			215							
Capacitance Ga	e Reading	29°	5	<del></del>			عنوافا				
Exit Burr Heigh											
		Air Gage	Reading	s ( 000	1 in )		· · = `				
	2		lar Posi		<u>/</u>		,				
Axial Position	0°	45°	90°	180°	225°	270°	315°				
Bottom #1	-14.0	-15.0	-15.0	-15.0	-150	-15.0	-15.0				
#2	1.0	0	0	0	0	0	1.0				
#3		3.0	3.0	0.9	2.0	2.0	3.0				
#4		3.0 2.0	2.0	3.0	3.0	3.0	3.0				

MANUFACTURING REPORT: TAPERED HOLES											
Test S Specim	Test Series 23 Quality Variable SURFICE ROUGANESS 12 T RMS Specimen No. 2468C 2681TC MID. INT.										
	Hole Manufacturing Conditions and Procedures: REAM UNDERSIZE REAMER										
Spindle, rpm 80 Feed: 55 81 IPM. Cutting Fluid: DRY Depth: (Ind. Reading) 2.440											
Hole #1 Surface Finish, AA 95-100 Protrusion, in. 178 Perpendicularity, .001 in./in.											
Flus Capa	Perpendicularity, .001 in./in. Longitudinal .0005 Transverse .0005 Flush Gage Reading, in00  Capacitance Gage Reading										
	Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	#2	-15.0 0	-15.0 1.0	-15.0 1.0	-14.0	-15.0 1.0	-15.0 1.0	-15.0 1.0			
	#3	2.0	2.0 2.0 2.0	3.0 3.0 3.0	3.0 3.0 4.0	1.0	2.0 4.0	2.0 2.0 4.0			
Surf	ace Finish, A	A 100		lole #2		Blui	ng Pin f	Rollout			
Prot Perp Flus Capa	rusion, in endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 in .0005 in .0005 Reading	n./in. Transver	se <u>,00</u>				5			
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	Bottom #1 #2 #3	-14.0 0 3.0	-15.0 1.0	-15.0 1.0 2.0	1.0	-\4.0 1.0	-13.0 2.0 2.0	-150 0 2.0			
	#4	3.0 4.0	2.0	0.0	4.0	4.0	2.0 4.0	2.0 3.0			

	<del></del>									
	MA	NUFACTU	RING REP	ORT: T	APERED I	HOLES				
Test Se Specime	Test Series 23 Quality Variable SURFACE ROUGHNESS-RIFLING Specimen No. 4E2TC & 3E4BC MID. INT. 125 RMS									
Hole Manufacturing Conditions and Procedures: REAMUNDERSIZE REAMER 1755 MOD. L.H. SPIRAL REAMER, USING MOD. L.H. SPIRAL REAMER PUBH IN ". 400-500 DEEP, NO RPM.										
:pin	dle, rpm <u><b>A</b>(</u> ing Fluid:			F		nd. Rea	Ading) 2	.440		
				Hole #1						
	ace Finish, rusion, in.			nore #1		Blu	ing Pin	Rollout		
Perp	endicularity	, .001 i	n./in.	000	 E		<del></del> ,	2.2 10.00		
Flus	ongitudinal h Gage Readi	ng, in.	00	2	<b>2</b>	,		han.		
	citance Gage Burr Height		_332							
	3	_	ir Gane	Reading		1 in )		;		
	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-15.0	-15.0	-13.0	-15.0	-15.0	-15.0	-40		
	#2	3.0	3.0	0.5	2.0	0.5	0.1	2.0		
	#4	2.0	0.5	0,1	0	0	0	1.0		
	#5	2.0	2.0	0	0	1.0	1.0	0.5		
Proti Perpe L Flush Capac	ace Finish, A rusion, in. endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 i .0005 g, in. Reading	n./in. Transver 002	se <u>.00</u>	10	Blui	ng Pin f	Rollout		
LAIL	buil noight,						1			
		<u>A</u>	ir Gage Angul	Reading ar Posi		<u> </u>				
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
		-15.0	-13.0	-15.0	-14.0	-13.0	-15.0	-13.0		
	#2	10	2.0	2.0	1.0	1.0	1.0	2.0		
	#3	2.0	3.0 3.0	4.0	50	0.9	2.0	2.0		
	#5	4.0	0.5	3.0	0.5	1.0	0.5	1.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Ser Specimen	Test Series 23 Quality Variable SURFACE ROUGHNESS-RIFLING Specimen No. 3EIB LEARBC MID-INT. 125 RMS									
Hole Manufacturing Conditions and Procedures: REAM UNDERDIZE REAMER 1.755 REAM MODILH SPIRAL REAMER USING MODILH SPIRAL REAMER PUBH IN .400500 DEEP NORPM  Spindle, rpm _80 Feed: _558 IPM										
Cutti	ng Fluid:	DRY		De	epth: (I			.440		
Hole #1 Surface Finish, AA 100-125 Protrusion, in170  Bluing Pin Rollout										
Perpe Lo	ndicularity ngitudinal Gage Readin	, .001 i	ransver	se <u>.0010</u>	_		=1.	the same		
Capac	itance Gage Burr Height,	Reading	357	,	<del></del>		æ			
_	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	#2 #3	-15.0 LO	-15.0 LO	-15.0	-15.0	-14.0	-14.0 1.0	-15.0 0		
-	#3 #4 #5	2.0 1.0 1.0	0.5	1.0	0.5	0.1 0.1	3.0 2.0 2.0	0.5		
C6	o Finish A	Λ		Hole #2	<del></del>	D1	na Din I	Pollout		
Protru Perper Lo Flush Capaci	ce Finish, Ausion, in	.001 in .0015 g, in. Reading	n./in. Transver <u>002</u>	rse <u>(00</u>		BIUI	ing Pin I	KOTTOUT		
EXIL	Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3	1.0	-12.0 0	-13.0 2.0 4.0	-13.0 1.0	-4.0 1.0 2.0	-12.0 2.0	-15.0 LO 2.0		
E	#5	3.0 3.0 5.0	2.0 2.0 5.0	3.0 4.0	1.0 3.0 4.0	2.0	4.0 4.0 3.0	1.0		

Test Se	m/ eries <u>23</u> en No. <u>GBG</u> E	Qua 1	ity Var	PORT: T	URFAC		iness - R	IFLING		
Hole Ma L75 Pur Spir	5 REAM MOD BHIN" 400- ing Fluid:	Conditi L.H.DP 500 NO	ons and	AMER.I	res: <u>N</u> ISING M	EAM U	DERBIZ DEIRAL			
Surf Prot Perp L Flus Capa	ace Finish, rusion, in. endicularity ongitudinal h Gage Readi citance Gage Burr Height	AA	in./in. Transver	Hole #1		<del></del>	ilng Pin			
Air Gage Readings (.0001 in.) Angular Position Axial										
	Position Bottom #1	0°	45°	90°	180°	225°	270°	315°		
	#2 #3 #4	0 2.0 1.0	2.0 1.0	0.5 0.1	1.0 3.0 1.0	2.0 3.0 1.0	0 2.0 0.5 0.5	0 0 0		
Surfa	ace Finish, A	A 95.		Hole #2			ing Pin			
Perpe I Flusi Capac	rusion, in. endicularity, Longitudinal h Gage Readin citance Gage Burr Height,	.001 i . <b>0010</b> g, in. Reading	Transver			•		∮		
		<u>A</u>		Reading ar Posi						
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
1	Bottom #1 #2 #3	15.0 0 2.0	-11.0 1.0 3.0	-14.0 2.0 4.0 2.0	-15.0	-15.0 1.0 2.0	0.61-	-150 0		

MANUFACTURING REPORT: TAPERED HOLES											
Test So Specime	eries <u>23</u> en No. <u>3E2T</u> C	Qual	ity Vari	lable 9	MID. IN	ROUGHN T. 125 RN	LDD - RIF	LING			
Pu Spir	Hole Manufacturing Conditions and Procedures: REAM UNDERSIZE REAMER  L755 REAM MOD. L.H. SPIRAL REAMER, USE MOD. L.H. SPIRAL REAMER  PUBHIN", 400-,500 NO R.P.M.  Spindle, rpm 80 Feed: D5 B.P.M.  Cutting Fluid: DRY Depth: (Ind. Reading) 2.440										
Cut	ting Fluid:	DRY		D	epth: (	Ind. Rea	ding) 2	.440			
Hole #1 Surface Finish, AA 95-100 Bluing Pin Rollout Protrusion, in. 170											
rerp	pendicularity	, .001		se nnn	 K			Harry A.			
Flus Capa	Longitudinal <u>0005</u> Transverse <u>0005</u> Flush Gage Reading, in. <u>0000</u> Capacitance Gage Reading <u>337</u> Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position											
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2	-14.0	-15.0	-15.0	-15.0	-150	-14.0	-15.0 1.0			
	#3	0	0.9	3.0	10	1.0	20	0.3			
	#5	0.3	0.5	3.0	1.0	1.0	1.0	1.0			
					1 101		- 1111	1_1.V_			
	ace Finish, A			Hole #2		Blui	ng Pin I	Rollout			
Prot	rusion, in endicularity,	168	n /in				74	22			
	Longitudinal	.0005	Transvei	se .00	05		74				
Flus	h Gage Readin citance Gage	g, in.	.0000		_		•				
	Burr Height,						,	10.7			
	Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°										
		-15.0	-14.0	- 14.0	-15.0	-H.Q	-150	-15.0			
	#2	2.0	3.0	3.0	1,0	0.1	1.0	1.0 2.0			
	W4 2.0 3.0 3.0 0 1.0 2.0 0										
	#5	1.0	2.0	1.0	0	1.0	3.0	1.0			

<u> </u>	MA	NUFACTU	RING REF	ORT: T	APERED I	HOLES				
Test Se Specime	ries 23 n No. PESTC	Qual 4EIB	ity Vari C	able 9	MID. IN	ROUGHN IT. 125 R	IESS - RI	FLING		
1.75	nufacturing 5 REAM MOD MIN 400-50	L.H.SP	RAL RE			LLH. BP				
Spin	dle, rpm <u>80</u> ing Fluid:				eed: 50 epth: (1	SAIPM. nd. Rea	ding) g	.440		
Hole #1 Surface Finish, AA Bluing Pin Rollout Protrusion, in. 160										
Protrusion, in. 160 Perpendicularity, .001 in./in. Longitudinal .0005 Transverse .0005										
Flush Gage Reading, in. +.003 Capacitance Gage Reading 324 Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position										
	Position	0°	45°	90°	180°	225°	270°	315°		
	#2	-15.0 0	-13.0	-9.0 2.0	-13.0	-12.0	12.0	-14.0		
	#3 #4 #5	1.0 1.0	2.0 2.0 1.0	3.0 2.0	0	0.0	3.0 3.0	2.0		
Surfa	ice Finish, A	Α	ŀ	lole #2		Blui	ng Pin f	Rollout		
Protr Perpe L Flush	rusion, in endicularity, ongitudinal Gage Readin	.001 ii .0005 g, in.	Transver +.000	5	00			*		
Capacitance Gage Reading 319 Exit Burr Height, in.  Air Gage Readings (.0001 in.)  Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2 #3	-15.0	- 15.0 0	-M.O	-15.0 Q	-15.0 2.0	-15. 2.0	-15.0 2.0		
	#4 #5	1.0	1.0 2	3.0	0	0.9	4.0 4.0 3.0	5.0		

	MA	NUFACTU	RING REP	ORT: T	APERED	HOLES					
Test S Specim	eries <u>23</u> en No.	Qua l	ity Vari	able <u></u>	BURF. R	GH. , B	ARRELLI	NG			
RE	anufacturing AMER TO 1.7	55 DE	M HIS	Procedu	res: <u>F</u>	REAME	ndersi R <sub>r</sub> ube	Z.E			
Spi	RING TOOL T ndle, rpm& ting Fluid:	0			eed: • epth: (	581PV Ind. Rea	ding) 2	.390			
Sur	Hole #1 Surface Finish, AA \00-125 Bluing Pin Rollout										
Protrusion, in. 180 Perpendicularity, .001 in./in.											
Longitudinal 0000 Transverse 0000  Flush Gage Reading, in. 0000  Capacitance Gage Reading 262											
Exit Burr Height, in.  Air Gage Readings (.0001 in.)											
	Angular Position Axial Position 0° 45° 90° 180° 225° 270° 315°										
	Bottom #1 #2	-10.0	-10.0 5.0	-10.0 5.0	-10.0 3.0	-11.0	-10.0 4.0	-9.0 5.0			
	#3 #4 #5	5.0 4.0	5.0 4.0	4.0 4.0	5.0 2.0	5.0	5.0	6.0 4.0			
		3.0	1 4.0	Hole #2	0.5 1	0.5 1	3.0	3.0			
Prot	ace Finish, A rusion, in.	85		· · · · · · · · · · · · · · · · · · ·		Blui	ng Pin I	Rollout			
Flus	endicularity, Longitudinal h Gage Readin citance Gage	0005 g, in.	Transver		05		-	100			
	Exit Burr Height, in.  Air Gage Readings (.0001 in.)										
	Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°			
	#2	-11.0 5.0	4.0	-11.0 4.0	-11.0 5.0	-II.0 5.0	-11.0 5.0	-11.0 4.0			
	#3 #4 #5	5.0 4.0	5.0 3.0	5.0 2.0	5.0 2.0 0	5.0 4.0	4.0 0	6.0 4.0 1.0			

	MA	NUFACTU	RING RE	PORT: T	APERED	HOLES				
Test Se Specime	ries <u>23</u> n No. <u>2048</u>	Qual C43D2	ity Vari	lable S	urf Ro Mid	HBARR	elling Brmb			
	nufacturing 5.RPAM MO									
Spin Cutt	dle, rpm <u>A</u> ing Fluid:	ORY.			eed: • epth: (	nd. Rea	ding)	2,430		
	ace Finish,			Hole #1		Blu	ing Pin	Rollout		
Perp	rusion, in. endicularity	, .001								
Flusi	ongitudinal h Gage Readi	0000 7	ransver 0000.	se <u>.000</u>	<u>0</u> _			· · · · · · · · · · · · · · · · · · ·		
Capa	citance Gage	Reading	223					*		
EXIT	Burr Height	, in				1	i			
Air Gage Readings (.0001 in.)										
	Axial	<del></del>	Angu	lar Posi	tion	<del></del>	- <sub>T</sub>	<del></del>		
	Position	0°	45°	90°	180°	225°	270°	315°		
		-10.0	-10.0	-11.0	-100	-10.0	-9.0	-10.0		
	#2	4.0	30	30	4.0	5.0	50	6.0		
	#3	6.0	6.0	5.0	6.0 5.0	5.0	5.0	0.0		
	#5	4.0	5.0	3.0	3.0	5.0	5.0	4.0		
Protr Perpe	ce Finish, A cusion, in. endicularity, ongitudinal	.001 i	1 <u>25</u> n./in.	Hole #2		Blui ,	ng Pin	Rollout		
	Gage Readir		0000.		<u>uv</u>					
Capac	itance Gage	Reading					. ,	-		
Exit	Burr Height,	-					,			
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1	-10.0	-11.0	-10.0	-11.0	-11.0	-10.0	-11.0		
	#2	4.0	4.0	3.0	3.0	4.0	3.0	5.0		
	#3	5.0	5.0	5.0 2.0	4.0	4.0	5.0 3.0	5.0		
	#4	4.0 2.0	4.0	3.0	3.0 2.0	3.0	0.5	2.0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 23 Specimen No. PAITO	146C57	ity Vari C	able 5	MID.	int. 125	RMS.	<u>G</u>			
Hole Manufacturing	Condition	ons and	Procedu MER 115	res: R	EAM UNI	TO DE	REAMER PTU.645			
Spindle, rpm 80 Feed: 53 BIPM Cutting Fluid: DRY Depth: (Ind. Reading) 2.390										
Hole #1 Surface Finish, AA 95-100 Bluing Pin Rollout										
Protrusion, in. <u>.175</u>										
Perpendicularity Longitudinal	0000	Transver	se .000	٥		,	. •			
Flush Gage Readi Capacitance Gage	ng, in.	.000	0			'.				
Exit Burr Height	, in.						•			
Air Gage Readings (.0001 in.)										
Angular Position +										
Axial Position	0°	45°	90°	180°	225°	270°	315°			
Bottom #1	-11.0	-10.0	-11.0	-110	-10.0	-110	-11.0			
#2	5.0	5.0	3.0	4.0 5.0	5.0	5.0 6.0	5.0 5.0			
#4	3.0	3.0	5.0 3.0	3.0	3.0	4.0	4.0			
#5	0	0	0	Ô	0	0	0			
Surface Finish, A	A 95		iole #2		Blui	ng Pin (	Rollout			
Protrusion, in. Perpendicularity	180	n /in				1	44			
Longitudinal			se ,000	00			i 🔹			
Flush Gage Readir	g, in.	002	0			1				
Capacitance Gage Exit Burr Height,		207	· · · · · · · ·	_			-			
	_		D = 12 = =				75			
Air Gage Readings (.0001 in.) Angular Position										
Axial Position	0°	45°	90°	180°	225°	270°	315°			
Bottom #1										
#2										
#3	6.0 5.0	5.0 5.0	5.0	5.0 3.0	6.0 5.0	6.0 5.0	6.0 3.0			
#5	3.0	3.0	5.0	3.0	3.0	3.0	4.0			

MANUFACTURING REPORT: TAPERED HOLES										
	ries <u>23</u> n No. <u>602</u> T	Qual CABA	ity Vari	able <u>c</u>	SURF. RI	3H. BAR	RELLIN	a		
Hole Ma	nufacturing   5,MOO.LWSP	Condition	ons and	Procedu USE BOR	res: RI	L TO 6	ersile 15 dele	Reamer		
Spin Cutt	dle, rpm <u>A</u> ing Fluid:	DRY				nd. Read		2.390		
Hole #1 Surface Finish, AA 95-100 Bluing Pin Rollout Protrusion, in										
Perpendicularity, .001 in./in.  Longitudinal 1000 Transverse 1000  Flush Gage Reading, in0002  Capacitance Gage Reading 263										
Exit Burr Height, in.										
Air Gage Readings (.0001 in.) Angular Position										
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2	-12.0 5.0	-12.0 5.0	-120	-12 <u>0</u>	-12.0 5.0	-12.0 5.0	-12.0 5.0		
	#3	5.0	4.0	4.0	5.0	5.0	5.0	3.0		
	#4	3.0	4.0	0.5	1.0	3.0	4.0	3.0		
Protr Perpe L Flush Capac	Hole #2  Surface Finish, AA 95-120  Protrusion, in									
•	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	#2	-11.0 5.0	-10.0 4.0	-11.0 4.0	-11.0 4.0	-1L0 3.0	-11.0 5.0	-11.0 5.0		
	#3	20	4.0	5.0 10	5.0 3.0	5.0 3.0	5.0 2.0	5.0 3.0		
	#5	0	0	0	0	0	0	0		

MANUFACTURING REPORT: TAPERED HOLES										
Test Series 23 Specimen No. 6061	Qua 1	ity Vari	able g	DURF. RG	HBAR	RELLIN	G			
Hole Manufacturing TO 1.755 DEPTE	Conditi	ons and	Procedu RAL REA	res: R	EAM UNIT	DERSIZE	REAMER 645 DR			
Spindle, rpm 80 Feed: 338 (PM Cutting Fluid: DRY Depth: (Ind. Reading) 2.390										
Hole #1 Surface Finish, AA 95-100 Bluing Pin Rollout										
Protrusion, in. 190										
Perpendicularity, .001 in./in. Longitudinal .0010 Transverse .0005										
Flush Gage Readi Capacitance Gage	ng, in. Reading	0000				1.1	1 11			
Exit Burr Height	, in.			_			مد			
Air Gage Readings (.0001 in.)										
Axial	Angular Position •									
Position	0°	45°	90°	180°	225°	270°	315°			
Bottom #1	-12.0	-11.0	-11.0	-110	-11.0	-10.0	-110			
#2	5.0 5.0	4.0	5.0 5.0	3.0 5.0	5.0 5.0	5.0	5.0			
#4	3.0	1.0	1.0	0.5	0.5	4.0	3.0			
#5	0.5	3.0	0.9	5.0	3.0	3.0	0.5			
Surface Finish,	AA 00-		tole #2		Blui	ng Pin I	Rollout			
Protrusion, in.	180			<del>-</del>	<u> </u>	<u> </u>				
Perpendicularity Longitudinal			se <u>,00</u>	05		, I	- 1. ·			
Flush Gage Readi	ng, in.	.0000		_	T.					
Capacitance Gage Exit Burr Height		_250		_		!				
	Δ	ir Gage	Reading	 _ (_0001	in.Y		A:			
Air Gage Readings (.0001 in.)  Angular Position										
Axial Position										
Bottom #1	-11.0	-11.0	-10.0	-10.0		-lrō	-11.0			
#2										
#4	5.0 3.0	3.0 2.0	3.0	5.0	4.0	4.0	5.0			
#5	3.0	0.5	2.0	2.0	3.0	4.0	4.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test So Specime	eries <u>23</u> en No. <u>3D4T</u> 0	Qual	ity Vari	able s	BURE F	RGH. OV D. INT:	ALITY			
1.75 PL	anufacturing 15 DR REAM I INGE 1.700+/-	-1006 IN	SPIRAL	REAME	LUSE ST	EAM UNI	DERSIZE E REAMI	REAMER		
Spin	ndle, rpm <u>8</u> ting Fluid:	0		F	eed: 5	581PM Ind. Rea	ding) 2	.400		
Hole #1 Surface Finish, AA 95-100 Bluing Pin Rollout										
Protrusion, in. <u>180</u> Perpendicularity, .001 in./in. Longitudinal <u>0010</u> Transverse <u>0005</u>										
Flush Gage Reading, in003 Capacitance Gage Reading 288 Exit Burr Height, in.										
Air Gage Readings (.0001 in.)  Angular Position										
.50	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	10	2.0	3.0	1.0	1.0	LO	2.0		
	#3 #4 #5	3.0 4.0 5.0	6.0 7.0 6.0	6.0 7.0 6.0	3.0 3.0 3.0	4.0 5.0 4.0	6.0 5.0	5.0 6.0 6.0		
Surf	ace Finish, A	A 20		dole #2		Blui	ng Pin I	Rollout		
Prot Perp	rusion, in endicularity,	.001 i	n./in.		_	:				
Flus Capa	Longitudinal h Gage Readin citance Gage Burr Height,	g, in. Reading	Transver -003 -295			••• • •	! , !			
3/7	Air Gage Readings (.0001 in.)  Angular Position									
	Axial Position 0° 45° 90° 180° 225° 270° 315°									
	Bottom #1 #2	5	0.5	3.0	<u> </u>	3.0	2.0	2.0		
	#3 #4 #5	3.0 4.0 3.0	5.0 7.0 9.0	60 80 80	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	4.0 5.0 5.0	5.0 7.0 5.0	5.0 6.0 5.0		

MANUFACTURING REPORT: TAPERED HOLES										
	ries <u>23</u> n No. <u>4067</u> C		ity Vari C	able S	URF. RO	SH. OYAI D. INT,	JTY.	-		
1.75. PLU Spin		JOD LH.	SPIRAL	REAMER SVERDE Fo	PO5.	TR FLUT	E REAL	REAMER MER 2.400		
Prot Perp	_e Finish, / rusion, in. endicularity	.75 .001 i	n./in.	Hole #1		Blui	ing Pin	Rollout		
Flus Capa	Longitudinal 0000 Transverse 0005 ush Gage Reading, in. 000 pacitance Gage Reading 287 it Burr Height, in.									
.317	Air Gage Readings (.0001 in.) Angular Position									
.925	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2 #3	LO 4.0	2.0	3.0	0.5	1.0	3.0	0.5		
	#4	5.0 4.0	5.0 6.0	7.0 6.0	3.0	6.0 6.0	7.0 6.0	7.0 5.0		
Proti Perpe l Flush Capac	Hole #2  Surface Finish, AA 95-100  Protrusion, in. 175  Perpendicularity, .001 in./in.  Longitudinal 0000 Transverse 0010  Flush Gage Reading, in. 000  Capacitance Gage Reading 309  Exit Burr Height, in.									
.317 .322	Air Gage Readings (.0001 in.) Angular Position									
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1 #2	0	0	2.0	0	1.0	1.0	-15.0 3.0		
	#3 #4	0.5	5.0 6.0	6.0 6.0	1.0 1.0	4.0 5.0	5.0 7.0	6.0 8.0		
	#5	0.5	5.0	6.0	3.0	5.0	5.0	6.0		

	МА	NUFACTU	RING REP	ORT: T	APERED H	IOLES					
Test Se Specime	eries <u>23</u> en No. <u>6DIBC</u>	Qual E3E5TO	ity Vari	able <u>c</u>		GH. OV	ALITY				
1.755 1.70	Hole Manufacturing Conditions and Procedures: REAM UNDERSIZE REAMER 1.755 OP REAM MODILA SPIRAL REAMER USE STR. FUTE REAMER PLUNGE 1.700 +/006 IN TRANSVERSE POS. Spindle, rpm 80 Feed: 55 8 IPM										
Cutt	ting Fluid:	DRY	<del></del>		epth: (I	nd. Read	ding) <u>{</u>	2.400			
Hole #1 Surface Finish, AA <u>95-100</u> Protrusion, in, 175											
Protrusion, in175 Perpendicularity, .001 in./in. Longitudinal .0015 Transverse .0005											
Flush Gage Reading, in001 Capacitance Gage Reading 256 Exit Burr Height, in.											
	Air Gage Readings (.0001 in.) Angular Position										
.316	Axial Position	0°	45°	90°	180°	225°	270°	315°			
.500	Bottom #1 #2	0	0	1.0	0	2.0	4.0	1.0			
	#3	2.0	4.0	5.0	0.5	5.0	8.0	6.0			
	#5	3.0	5.0	5.0	0.5	6.0	5.0	6.0			
	ace Finish, A			dole #2		Blui	ng Pin	Rollout			
	endicularity, Longitudinal	0010	Transver	se <u>.00</u>	00	•					
Capa	h Gage Readin citance Gage Burr Height,	Reading	- <u>.001</u> 273	)	_			4			
.316		<u>A</u>	ir Gage Angul	Reading ar Posi		in.)		Care Service			
.30	Axial Position										
	Bottom #1		}	<b>}</b>	~~	~	~	~			
	#2	3.0	3.0	0 5.0	2.0	2.0 5.0	3.0 6.0	2.0 5.0			
	#4	4.0 4.0	4.0	5.0 5.0	0.5	6.0 5.0	7.0 6.0	6.0 5.0			

MANUFACTURING REPORT: TAPERED HOLES										
Test Se Specime	eries <u>23</u> en No. <u>3C3T</u> C	Qua 1	ity Vari IC	able <u>S</u>	URE RG	H. MID. II	AVOTV	LITY		
1.75 PLU	enufacturing 5 DR REAM M NGE 1700 +/- ndle, rpm	.006 IN	PIRALRE	ERDE PO	SE STR	FLUTE R	EAMER	REAMER		
Cuti	ting Fluid:	DRY	<del></del>		eed: <u>S</u> epth: (1	nd. Read		.400		
Surf	Hole #1 Surface Finish, AA <u>95-100</u> Protrusion, in175									
Protrusion, in\75 Perpendicularity, .001 in./in. Longitudinal .0000 Transverse .0005 Flush Gage Reading, in0000 Capacitance Gage Reading 268										
Exit	Exit Burr Height, in.									
217	Air Gage Readings (.0001 in.) Angular Position									
,30,	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1						-150			
l	#2	1.0	3.0	3.0	1.0	2.0	3.0	5.0		
j	#3	4.0	6.0	6.0	3.0	6.0	6.0	7.0		
	#4	5.0 4.0	7.0 6.0	6.0	4.0	6.0 5.0	8.0 6.0	5.0 9.0		
Surf	ace Finish, A	A 05-		lole #2	<del> </del>	Blui	ng Pin I	Rollout		
Prot	rusion, in. $\_$	177				,				
	endicularity,									
	Longitudinal h Gage Readin		.0000		15		-	4		
	citance Gage		294		_					
	Burr Height,									
123			ir Gage	Dandina	- / 0001	:= 1				
318		<u>~</u>		ar Posi		111./				
	Axial Position	0°	45°	90°	180°	225°	270°	315°		
	Bottom #1									
	#2	1.0	0.5	3.0	0	1.0	3.0	2.0		
	#3	3.0	5.0	6.0	2.0	5.0	6.0	<u>e</u> 0		
	#4	3.0 3.0	5.0 6.0	6.0	4.0 3.0	5.0 5.0	<b>8.</b> 0 <b>5.</b> 0	7.0 5.0		
		7.7	<u> </u>	שיט	_V.V	- V.V	<u> </u>			

	MA	NUFACTU	RING REF	PORT: T	APERED	HOLES		
Test Series 23 Quality Variable SURF. RGH. MID. INT. OVALITY Specimen No. 6028240ITC								
Hole Manufacturing Conditions and Procedures: REAM UNDERSIZE  REAMER 1.755, REAM MODILY, SPIRAL REAMER, USE STR. FLUTE REAM  PLUNGE 1.700 = .00% IN TRANSVERSE POS.								
Spir	idle, rpm	DRY		F	eed: ;	SS & IPA Ind. Rea	ر ding) کے	.390
Hole #1 Surface Finish, AA 90-95 Bluing Pin Rollout Protrusion, in. 180								
Perpendicularity, .001 in./in. Longitudinal .0000 Transverse .000 Flush Gage Reading, in0000								
	citance Gage Burr Height	, in	280				•	
Air Gage Readings (.0001 in.)  Angular Position								
310	Axial Position	0°	45°	90°	180°	225°	270°	315°
	Bottom #1 #2	1.0	2.0	3.0	1.0	3.0	-15.0 3.0	3.0
	#3	4.0	6.0	6.0	3.0	6.0	7.0	7.0
	#4	4.0 5.0	6.0	6.0	4.0	6.0	8.0 7.0	5.0 8.0
Hole #2 Surface Finish, AA 95-100 Bluing Pin Rollout Protrusion, in. 180								
Perpendicularity, .001 in./in.  Longitudinal 0000 Transverse 0005  Flush Gage Reading, in. 0000  Capacitance Gage Reading 281  Exit Burr Height, in.								
Air Gage Readings (.0001 in.) Angular Position								
•	Axial Position	0°	45°	90°	180°	225°	270°	315°
	Bottom #1				-14.0			
	#2	0 1.0	3.0	2.0 5.0	0.1 0.2	4.0	3.0 6.0	1.0 5.0
	#4	0	4.0	6.0	3.0 3.0	5.0	8.0	5.0
	L	3.0	4.0	5.0		5.0	5.0	6.0

